[H.A.S.C. No. 115–49]

HEARING

ON

NATIONAL DEFENSE AUTHORIZATION ACT FOR FISCAL YEAR 2018

AND

OVERSIGHT OF PREVIOUSLY AUTHORIZED PROGRAMS

BEFORE THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES HEARING

ON

GROUND FORCE MODERNIZATION BUDGET REQUEST

HEARING HELD
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CONTENTS

GROUND FORCE MODERNIZATION BUDGET REQUEST

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES,
Washington, DC, Wednesday, May 24, 2017.

The subcommittee met, pursuant to call, at 3:36 p.m., in room 2118, Rayburn House Office Building, Hon. Michael R. Turner (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MICHAEL R. TURNER, A REPRESENTATIVE FROM OHIO, CHAIRMAN, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Mr. TURNER. The hearing will come to order. The subcommittee meets today to review the Army and Marine Corps ground force equipment modernization budget request for fiscal year [FY] 2018. From our previous hearings held in March, we are aware that the Army and Marine Corps continue to face significant challenges in rebuilding full-spectrum readiness from years of deferred modernization funding.

We are particularly interested in understanding how this budget request will begin the process of reversing the trend in deferred modernization funding. I would like to welcome our guests representing the Army and Marine Corps: Lieutenant General John M. Murray, Deputy Chief of Staff, G–8; Lieutenant General Paul A. Ostrowski, Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics and Technology); Lieutenant General Gary L. Thomas, Deputy Commandant for Programs and Resources; Brigadier General Joseph Shrader, Commanding General, Marine Corps Systems Command. Thank you each for your dedicated service and for being here today.

Today the subcommittee will review the broad portfolio of ground force equipment modernization programs and their associated acquisition strategies. We expect to gain a better understanding of Army and Marine Corps modernization priorities in fiscal year 2018 and beyond. As such, the witnesses have been asked to identify their top five modernization requirements and briefly summarize how the budget request addresses them.

The subcommittee will be particularly interested in learning of any unfunded requirements the Army and Marine Corps may have for fiscal year 2018. Yesterday, the administration released its budget request for the Department of Defense [DOD] that amounts to a $603 billion top line. Since we just received the request, we are still in the early stages of reviewing the specifics of the budget request, which makes this hearing so timely.

As I have stated at previous hearings, I support the President's commitment to rebuilding the military. However, I am concerned that the current budget request does not go far enough. I support Chairman Thornberry's statement, "The administration's budget proposal for defense is not enough to do what the President said he wants to do. In order to begin to repair the damage that has been done to readiness, and to build the capacity needed for today's dangerous world, we believe that $640 billion is required for fiscal year 2018."

A topline budget of $603 billion for defense in fiscal year 2018 really only represents 3 percent growth above President Obama's projected budget request for fiscal year 2018 from last year. To be fair enough, it does appear that the Army's modernization request (procurement, RTD&E [research, testing, development, and evaluation]), and the Marine Corps ground equipment procurement request do provide for some improvement over fiscal year 2017 projected levels. The problem is that due to multiple years of underfunding and reduced budgets, these relatively modest increases aren't enough to actually reverse the damage that has been done.

For example, the request provides the funding necessary to modernize about half of one [armored] brigade combat team, meaning that the Army is on a path to fully modernize all of their armored brigade teams by 2035, which is a problem.

Finally, I continue to have concerns that we are losing our comparative advantage in ground combat overmatch against near-peer and peer competitors. Legacy combat vehicle platforms in some cases are nearing the 40-year mark in terms of service, and I am concerned that these vehicles are reaching limitations in terms of capability.

So I am particularly interested in understanding how this budget request begins to address next generation combat vehicle systems. And I would like to recognize my good friend, Niki Tsongas.

[The prepared statement of Mr. Turner can be found in the Appendix on page 21.]

STATEMENT OF HON. NIKI TSONGAS, A REPRESENTATIVE FROM MASSACHUSETTS, RANKING MEMBER, SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES

Ms. TSONGAS. Thank you, Mr. Chairman, and good afternoon.

I look forward to discussing the budget for both the Army and Marine Corps with our witnesses here today, and I thank you for being here. But first, I would like to address concerns I have with the approach taken by the broader Federal budget released just yesterday. The fiscal year 2018 President's budget prioritizes defense spending at the expense of other national priorities, like education, infrastructure, and economic development.

Of particular relevance to our discussion here today, the budget also makes deep cuts to the State Department and USAID [United States Agency for International Development], to international security assistance programs that provide defense equipment and training to our partners abroad, and to the Treasury's office responsible for combatting terrorist financing, just to name a few. And these cuts are even more pronounced over a 10-year period.

Increasing defense spending at the expense of these other critical programs will not only make us less safe, but will undermine important investments key to our national competitiveness and our long-term security. With that in mind, today's hearing is the first chance the subcommittee has to review the Army and Marine Corps fiscal year 2018 budget request. The delay in completing the budget does put pressure on us to get as much information today as possible, given the short time available before consideration of the 2018 NDAA [National Defense Authorization Act] next month. And there are a few points I would like to make.

First, the 2018 budget request for Army and Marine Corps modernization accounts do appear to show modest growth in comparison to the final 2017 figures for both services; welcomed news given the services' modernization needs, but I hope to hear today how you both plan on using the additional funding to both expand current programs and set the stage for the future by starting some new ones.

Research, development, test, and evaluation accounts seem to have also grown at a modest level. I have been worried for some time by the rapid decline in R&D [research and development] funding, especially for the Army, which over the past few years has reached troublesome lows. I hope to hear more today about both new development programs and expanded research in the science and technology, or S&T, accounts.

The second broad issue I wanted to touch on is the importance of keeping a focus on improving personal protective equipment, like body armor, helmets, and related materials. Both services continue to make substantial investments and field new equipment, which is encouraging. I think this is both the smart thing to do, but also the right thing to do, given the risks that members of our military take every day. The cost of these programs in comparison to the billions needed for tanks or helicopters is relatively small, but should be protected and expanded.

A final point I wanted to make was about the importance of competition. A series of laws, Executive orders, and subsequent regulations make full and open competition the standard method for acquisition of equipment by the military services. That was done in the taxpayers' interest to ensure fairness, reduce costs, increase transparency, and foster a healthy defense industrial base.

However, we all know that the competition process usually does take more time than doing a sole-source award. For me, that trade-off, a more time-consuming process, is worth it, except in cases of true emergency combat needs or when optimal products already exist in the commercial sector, situations which have prompted the congressional defense committees to craft needed workarounds.

So as both services make use of the exceptions to competition that the law allows, I would caution that it be done thoughtfully, carefully, and only in the case of true urgency. The overarching goal should be to both achieve the benefits of competition and to ensure that the flexibility currently enjoyed by the military services is preserved. With that in mind, I look forward to today's testimony, and I yield back.

Mr. TURNER. Thank you. I understand that General Murray will provide the remarks on behalf of the Army and General Thomas

will provide remarks on behalf of the Marine Corps. Before we begin, they have projected votes between 4:05 and 4:35. And then we are going to have an hour-long vote, and after that it is going to be difficult to get members back. If we give each of you 5 minutes, if you can shave off a minute or two there, we are going to go to 3-minute rounds of questions, and I am going to abbreviate mine. And I think we will get through everybody if we get to a reasonable time for the votes.

So with that, gentlemen, please begin. General Murray.

STATEMENT OF LTG JOHN M. MURRAY, USA, DEPUTY CHIEF OF STAFF OF THE ARMY, G–8; AND LTG PAUL A. OSTROWSKI, USA, MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY (ACQUISITION, LOGISTICS AND TECHNOLOGY)

General MURRAY. And I will read fast, Mr. Chairman, so thank you. Chairman Turner, Ranking Member Tsongas, distinguished members of the Subcommittee on Tactical Air and Land Forces, on behalf of our Acting Secretary, the Honorable Robert Speer, and our Chief of Staff, General Mark Milley, we look forward to discussing with you the fiscal year 2018 President's budget request for Army modernization.

The fiscal year 2018 modernization budget request of $26.8† billion represents a modest increase in modernization. Additional funding sustains, but it does not significantly advance our modernization efforts. Given today's fiscal environment, our modernization strategy remains to focus our limited modernization budget on the equipment that will have the greatest impact against near-peer threats and can be in the hands of our soldiers in the near future.

For the past 10 years, we have focused on the immediate, providing the equipment necessary for our soldiers to fight in Iraq and Afghanistan, along with incremental upgrades to our existing combat platforms. That strategy, driven primarily by constrained modernization resources, forced us to defer the development of new combat capabilities. We have now reached a point in time where we can no longer afford to do one or the other: improve existing systems or develop new ones. We must begin to do both.

We face critical capability and capacity gaps in areas like air and missile defense, long-range precision fires, munitions, the mobility protection and lethality of our brigade combat teams, and active protection to name just a few. We must begin to fill these gaps if we are to credibly deter, and if necessary defeat a near-peer adversary. These are challenging times. In the end, the security challenges of tomorrow will be met with equipment we develop, modernize, and procure today.

Because adversaries will continue to invest in technology to counter or evade U.S. strengths and exploit vulnerabilities, resource insecurity and insufficient force modernization will place the Army's ability to overmatch its opponents at risk. We owe our future soldiers the equipment they will need to fight and win on a very complex battlefield. We urge Congress to provide fiscal stability, funding that is sufficient, consistent, long-term, balanced, and

†General Murray submitted a correction of his hearing statement, changing $27.3 billion to $26.8 billion.

predictable, so we can maintain our current warfighting readiness while simultaneously building a more modern and capable force for the future.

I would like to thank you and the entire committee for your resolute support of the men and women of the United States Army, Army civilians, and our families, and I thank you, and I look forward to your questions.

[The joint prepared statement of General Murray and General Ostrowski can be found in the Appendix on page 23.]

Mr. TURNER. General Thomas.

STATEMENT OF LTGEN GARY L. THOMAS, USMC, DEPUTY COMMANDANT FOR PROGRAMS AND RESOURCES; AND BGEN JOSEPH SHRADER, USMC, COMMANDING GENERAL, MARINE CORPS SYSTEMS COMMAND

General THOMAS. Chairman Turner, Ranking Member Tsongas, and distinguished members of the subcommittee, thank you for the opportunity to appear before you today. I am honored to represent your Marines and testify on our fiscal year 2018 ground force modernization program.

Your Marines continue to be in high demand from all our combatant commanders around the world. They are forward-deployed, engaged on land and sea, and ready for crisis response. As a result, we must constantly balance between capability and capacity, between current operations and future operations, between steady state and surge readiness, as well as between low-end and high-end operations and training.

Our role as America's naval expeditionary force in readiness informs how we man, train, and equip our force. It also drives how we prioritize and allocate the resources we are provided by Congress. While today's force is capable and our forward-deployed forces are ready to fight, we have been fiscally stretched to maintain readiness across the breadth of the force. Our fiscal year 2018 budget request builds on the additional funding received in the fiscal year 2017 omnibus appropriation and begins the deliberate effort to fix readiness for today and tomorrow.

Modernization is central to addressing near-term readiness and foundational to building the Marine Corps of the 21st century. It includes replacement of legacy systems with new ones, such as the Amphibious Combat Vehicle [ACV], Joint Light Tactical Vehicle, the Ground/Air Task Oriented Radar [G/ATOR], the Common Aviation Command and Control System, and the CH–53K King Stallion; five key modernization efforts supporting how we are going to operate, fight in the future.

Modernization also includes changes to the structure of our tables of equipment that we continue to incorporate lessons learned from the battlefield into equipment sets that balance affordability with the need for a networked, mobile, and lethal expeditionary force. And it includes the insertion of technology into current capabilities, including such efforts as developing active protection systems, long-range precision fires, and unmanned aircraft system capabilities.

The Marine Corps must begin to rebalance and modernize for the future, creating a fifth-generation multi-domain force with over-

match that can deter and, if necessary, defeat a highly capable near-peer adversary. However, an unstable fiscal environment creates inefficiencies, disrupts our planning, and directly challenges our current and future readiness. With your help, we can begin to overcome these challenges and ensure that the Marine Corps is well postured for the 21st century.

Again, thank you for the opportunity to appear before you today. I look forward to your questions.

[The joint prepared statement of General Thomas and General Shrader can be found in the Appendix on page 34.]

Mr. TURNER. Excellent. Thank you, gentlemen. Well, to get us jump-started, I am going to ask three quick questions that I believe you can both answer yes to, which will get us moving. And so let's see if I am correct.

Obviously, we are concerned about the pace of modernization. If additional funding were provided, could you accelerate armored brigade combat team modernization? General Murray.

General MURRAY. Absolutely.

Mr. TURNER. General Thomas.

General THOMAS. We could accelerate key modernization programs, yes.

Mr. TURNER. Great. Second yes question. In your professional opinion, are changes to the current cluster munitions policy required to address current Army requirements and emerging threats? General Murray.

General MURRAY. I am not sure I completely understood the question, Chairman.

Mr. TURNER. We are very concerned about the policy concerning cluster munitions, which is going to impact your operations, your ability to utilize them. In your professional opinion, does that current policy need to be changed to be able to give you, as you look to requirements and emerging threats.

The second part of this—and I will just go ahead and tell you—is would the loss of the ability to use cluster munitions create an unacceptable capability gap for land component area effects, particularly in major combat operations against near-peer or near-peer-equipped opponents?

General MURRAY. The answer to the second one is absolutely. It is a critical operational capability that goes away on 1 January 2019. The answer to the first one, Mr. Chairman, is I think we have to at least look at it and consider it.

Mr. TURNER. General Thomas.

General THOMAS. We would advocate a change. The DPICM [Dual-Purpose Improved Conventional Munition] capability is very important to our force and to replace that capability is going to take a lot more time and a lot more money.

Mr. TURNER. Great, thank you. Ranking Member. And you should have a clock on me.

Ms. TSONGAS. Thank you. Thank you, Mr. Chairman. I am pleased that both services have ongoing efforts to improve the fit and function of female personal protective equipment, as the number of women serving in both the Army and Marine Corps continues to increase, and it is something we talk about often here.

But I am somewhat concerned that the two services are headed in different directions. My understanding is that the Marine Corps is making improvements aimed at making sure that marines of all statures are equipped with appropriately fitted plates. While that is important, appropriately sized plates are but one component of a system aimed at making sure women have equipment designed specifically to improve protection and range of motion.

The female improved outer tactical vest is an important example of how the Army is working to ensure that women have body armor with the appropriate form, fit, and function. So my concern is that the two services, while arguably trying to do what they think is right, are diverging in their approaches where there may be a great deal to be gained by a joint effort.

So, General Ostrowski and General Shrader, would you both talk about what you are doing in this area within your services and how it differs from the other service and why that is the case? So, General Ostrowski.

General OSTROWSKI. Ma'am, thank you for the question. I will tell you that I think you are very well aware that the Army has not only sized body armor for our males, 11 different sizes, but also for our females, 11 separate sizes with respect to body armor.

In addition to the five torso and three side plates, in terms of different sizes that we have had in the past, we have added an additional three torso plates, as well as an additional smaller side plate in order to address additional concerns with respect to our female soldiers.

Our next-generation soldier protection system, which will consist of about 121,000 systems for the folks, our soldiers that are on the leading edge in terms of engaging with and closing with the enemy in a close fight, will also include sizing for women. This is important based on where we have gone in terms of the Army and females' ability to serve within our infantry and armor forces.

In addition, we will have eight total sizes for the soldier protection system. This sizing is based on human factors designed—that we have done in conjunction with the Marine Corps; and the eight sizes, again, fit not only our male soldiers, but are designed to fit our female soldiers based on the addition of the new plates, as well as the scalable torso protection system that we have.

Ms. TSONGAS. We will go to General Shrader now, give you a quick time to respond. Maybe if you need more time, put it in the record later. Go ahead.

General SHRADER. Yes, ma'am. So I think General Ostrowski said it exactly what we are doing too—we are working with the Army on our new plate carrier that we are getting ready to field. As far as the plates are concerned, we are buying the same plates as the Army. So, yes, ma'am, we are working with the Army and moving forward.

Ms. TSONGAS. Well, the Army has done some wonderful things, so not only the outer tactical vests, but they have better designed female protective undergarments, ballistic combat shirts, and I would encourage the Marines to take a look at that full suite of investments.

Mr. TURNER. Mr. Cook.

Mr. COOK. Thank you, Mr. Chairman. First of all, I want to thank the Marine Corps for inviting us to the parade a couple of weeks ago. I have not dried out yet. And I have got cases of immersion foot and jungle rot, which goes back 50 years ago to when I was in Vietnam.

But anyway, a couple of systems which I am really impressed on, the Trophy system that you are looking at that, thank God that you are taking a look at that with the development of the T90 and everything like that. The Marine Corps I know is bringing on the new 81 Mike-Mike mortar, not new, but the munitions. Can you just give a quick heads-up on that, what is going on, on it?

General THOMAS. Congressman, we are looking at the ACERM [Advanced Capability Extended Range Mortar] round, which gives you the extended range for the 81-millimeter mortar. That is in technical demonstration right now, but we are paying close attention to that.

Mr. COOK. Yeah, as that goes along, I would be really interested in that. The other thing I wanted to address real quick—and everyone is aware of the RAND study. We are worried about long-range fires. The chairman talked about some of the things on that.

We are concerned, at least I am, on HIMARS [High Mobility Artillery Rocket System], whether we have enough ammunitions, the systems that—you know, that unclassified portion of it, 60 hours to be in Tallinn or Riga, if you could just briefly, anybody, how you looked at that, because I know it has got everyone's attention and some of your systems addressing that, because I think that is an important part of the budget, the way it stands right now.

General MURRAY. Yes, sir. So, Congressman, fire structure is part of the growth we will experience in 2018, with what we were granted, in terms of the growth of the Active Component to 476 [thousand]. We thank you. It is just not the munitions. It is also the HIMARS and MLRS [Multiple Launch Rocket System] to shoot it, correct.

Mr. COOK. Yeah.

General MURRAY. And then we have a program going right now called long-range precision fires. There is about $102 million in the base to take two prototypes into demonstration in 2019. In addition to that, we are also SLEPing, service life extension program, on our ATACMS [Army Tactical Missile System] missile to make sure we have got the inventory. And we are also working to double the range of the GMLRS [Guided Multiple Launch Rocket System] missile, as well.

Mr. COOK. Great. I am rushing real quick. By the way, I was just out at Fort Irwin. They did a great cyber exercise. Some of these kids, I mean, they are right out of Star Wars. They are talking about some of the gear coming right off the shelf. And very, very impressive.

The one thing that bothered me a little bit was the MICLIC [Mine Clearing Line Charge], the mine going out with—this is 50 years ago we were doing the same thing with the C4, the det cord [detonation cord] that goes out there. Of course, I am looking for something much quicker and wondering if there is anything in the works. And that is my last question. I yield back after that.

General MURRAY. There is not anything in the works to replace that currently, sir.

Mr. COOK. Okay, thank you.

Mr. TURNER. Mr. Langevin.

Mr. LANGEVIN. Thank you, Mr. Chairman, and I want to thank our witnesses for your testimony. And thank you all for your service to the country.

General Ostrowski, the Army's budget request shows $37 million for a leader-and-follow ground robotics effort that would allow in theory unmanned cargo trucks to follow a single truck driven by a soldier. Elsewhere in the budget request is a larger $70.8 million effort that is spread across seven different projects, including a squad multi-purpose transport, which appears to be a small cargo-carrying robot, and the common robotic system, which is a man packable, less than 25-pound ground robot with various sensors, and a soldier-borne sensor, which is a very small handheld UAV [unmanned aerial vehicle].

Could you please give us some details on these efforts and how they all fit together? And there is rapid progress in the commercial world on ground robotics. What year will the Army field its next generation of robots like the ones described in the research and development request? For example, when would the Army field a cargo or intelligence collection ground robot?

And then, finally, does the Army have any demonstrations planned to open up this area to commercial robot companies?

General OSTROWSKI. Sir, the Army has got a multifaceted approach to getting after ground robotics. And the Chief is leading the charge. He is all about ensuring, as we all are, that soldiers are not put into harm's way unnecessarily. The first of those efforts is the S&T effort that you talked about, Leader-Follower, which is in the S&T realm at the Army's TARDEC [Tank Automotive Research, Development, and Engineering Center] location now. The intent is to create the capability for a leader vehicle truck that could be followed by other additional carrying capability that will go from port to a base. Again, not off-road, but along highways. This takes into account the ability for us to use commercial technologies that have been developed and to leverage those particular technologies.

With respect to the SMET [Squad Multipurpose Equipment Transport] that you talked about, as well, the squad robotic capability, ability to move 1,000 pounds worth of equipment, our ability to do that is based on our acquisition strategy of going through other transactional authority to get vendors to come in to provide papers on how we can get after that particular capability, take that down-select to about 10, have them provide prototypes, and take those prototypes into test. And following the test, we will down-select about four. And between the period of 2019 to 2020, we will then place those four standard types into the field for evaluations on behalf of our soldiers that will lead to a decision by 2020 to make a call as to whether to field or not to field that particular capability.

Mr. LANGEVIN. Okay.

Mr. TURNER. Mr. Kelly.

Mr. KELLY. Thank you, Mr. Chairman. First, I am pleased to see the Army's request to upgrade the Abrams tanks to the M1A2 SEPV3 [System Enhancement Package Version 3]. And I understand the Army may attempt to accelerate additional upgrades for the SEPV4 configuration. That being said, the Abrams tank is now approaching 80 tons in gross vehicle weight. And what impact does this weight have and are we getting the Mike-88s to make sure that we can tow those things and also the things like the new JAB [Joint Assault] Bridge that we have been talking about since I was a young engineer lieutenant? You know, can our bridges, our gap crossing capability support these new 80 tons instead of 70?

General MURRAY. Yes, sir, so we have got several problems. So you have mentioned two of them would be the heavy equipment transport, or HETs. So right now, we have got work going on in several different paths on the heavy equipment transports. We have got a problem in Europe we have got to fix fairly quickly, which is one avenue of approach we are taking, and then we are also starting the development what we are calling the super HET to account for the weight of the tank, which is actually combat loaded about 78 tons. So you are correct, approaching 80.

With the bridges, we have got our engineers doing some work right now that it really comes down to the strength of the pins and the scissors as the weak point of that bridge. We can cross it right now, but only at caution crossing, which is basically walking speed. So we are working on the strength of the pins to try to save the bridges we have got and then increase the pins or increase the strength of the pins. And then you mentioned the HERCULES [Heavy Equipment Recovery Combat Utility Lifting Extraction System]. We also have an upgrade to the HERCULES in works. RTD&E is funding in 2018 and then actually going to development of allowing the HERCULES to do a single vehicle recovery.

Mr. KELLY. And I just ask that you pay real close attention to that. And we have got to have those upgrades in time to have them on the battlefield. And it is not just those force multipliers, but it is the things like our ISR [intelligence, surveillance, and reconnaissance] capabilities, are we up to range? It is the range on our artillery systems and our rocket systems as compared to our near-peers. I mean, it is a total force and you have got to bring every force multiplier. So I just—I ask both the Marine Corps and the Army to make sure that we get overmatch, because it is about rate of fire and standoff. And if you have got those two things, you win; if you don't, you lose. So please focus on that.

And then the other thing is, for both of you-all, on the aviation standpoint, I know the Army and especially the Army and the Marine Corps have our ITEP [Improved Turbine Engine Program] engines to make sure that we have got the increased capabilities for our rotor wing assets. Does that continue to be a top priority for both the Army and the Marine Corps?

General MURRAY. It does, Congressman.

General THOMAS. Congressman, for the Marine Corps perspective, not necessarily the ITEP, but modernization, particularly of our heavy lift capability, replacing the CH–53, which is rapidly reaching the end of its service life, with the CH–53K.

Mr. KELLY. And thank you, because that engine life and the lift power creates both costs, but also life-saving and safety issues. And with that, I yield back, Mr. Chairman.

Mr. TURNER. Thank you. Mr. Gallego.

Mr. GALLEGO. Thank you, Mr. Chairman. We kind of hit on this earlier, but I would like to go in a little more in depth regarding standoff ground fire capability. It is an area where we may be deficient versus our competitors on the Russian side, especially when it comes to anti-armor capability. What are the Army and Marines doing to consider building the long-range ground fires capability? Please include any anti-armor or sensor fuse capabilities as part of that answer.

General MURRAY. When you say long-range, I assume you are talking missile-delivered fires?

Mr. GALLEGO. Missile or artillery or——

General MURRAY. Okay. So, Congressman, we are working LRPF [Long Range Precision Fires], as I mentioned before, targeting about 499-kilometer range on that, which is current ATACMS is 350, limited only to 499 because of the INF [Intermediate-Range Nuclear Forces] treaty, and we are working to double the payload, so two per pod as opposed to one per pod, which is an automatic way of doubling your force structure.

We are working right now with two foreign governments on the potential of buying sensor fused munitions to put on both the GMLRS and the ATACMS. And we are working with Dr. Roper and the SCO [Strategic Capabilities Office], really, on some cannon delivered munitions that would be an effective anti-armor capability.

General THOMAS. Congressman, the way that we are getting after the long-range precision fire challenges, we are increasing capacity. With the growth to 185K [185,000], we are going to stand up an additional HIMARS battalion. In the FY 2018 request, we continue to purchase additional munitions, and we work very closely on the innovations that the Army is proceeding with that General Murray just described.

Mr. GALLEGO. In the meantime, what are the plans to maintain and replace the capabilities affected by DOD's cluster munitions policy in Europe and other key operational environments around the world, or at least temporarily?

General OSTROWSKI. Congressman, the plan right now is to service life extend our ATACMS missiles from a cluster munition back to a unitary. We also have height-of-burst capability that we have also proven on that particular missile system and just recently tested to good effect. So that is the key thing there.

With respect to the 155 rounds, our DPICMs, the intent there is to, again, use them if we can up until the point of time where we can't, and then those will be discarded and demilled. We are demilling 155s as we speak, as they have gone beyond their shelf life, but the others still remain in our inventory and are ready should the policy change or should we need them prior to the deadline.

Mr. GALLEGO. Lieutenant General.

General THOMAS. We continue to procure GMLRS alternative warhead, as to mitigate the challenge that General Ostrowski just

described, but that is going to take a long time. We wouldn't get our full requirement until the mid-2020s.

Mr. GALLEGO. Okay. Thank you. I yield back.

Mr. TURNER. Mr. Bacon.

Mr. BACON. Thank you, Mr. Chairman. I thank all four of you for being here. It is great to see my National War College classmate there, General Thomas. I was hoping you could give me your feedback on this perception. As I look out in our acquisition and our modernization, I think that we are going to produce future systems that have overmatch in the air domain, the sea domain. I think I feel like I could say the same thing in the space and cyber domains. But I worry about our land domain.

When I look at the future weapons systems, I see that our near-peers are producing stuff that are at parity or in some cases exceed when it comes to range, rate of fire, and so forth. So is my perception right? Should we be raising the bar on what we are going to produce for our soldiers and marines in the ground domain? Love to get your feedback.

General MURRAY. Yeah, I absolutely agree with you, Congressman. And I am—as I said the last time—I am kind of a parity type of guy, because it does depend on how you look at the system. And Army is absolutely trying to do that. And I said in my opening statement the last time and this time is that we are now at the point where it is going to be hard to upgrade our current combat systems to retain that parity and we have got to start looking at what comes next.

The fundamental issue the Army has is when you look at our modernization—we have to prepare—we have to make sure soldiers tomorrow have the best equipment we can possibly provide them, and we have also got to start looking to the future. So you have two different efforts going on. You have got upgrading the current equipment and you have got now I think some RTD&E started, next generation combat vehicles specifically, looking at future generation vehicle.

You know, I can do RTD&E. The problem comes in procurement. I can't begin to buy a new vehicle until I finish upgrading the last vehicle, and when you got extended upgrade timelines, it becomes one ECP [engineering change proposal] or one upgrade after another. So we have got to figure out how to shorten that timeline so I can free up the resources to go after the procurement of the next generation tank, air defense system, infantry fighting vehicle. I mean, there's lots of needs across the board.

General THOMAS. Congressman, we would share the concerns that you articulated. The Marine Corps, a little bit different than the Army, we are a light general purpose force. So we look at—much as the Army does, we look at the entire system together, which is our overmatch comes by our ability to maneuver and the fires that we can bring to bear. That is cannon artillery. It is rockets. But it is also aviation. So that will continue to be a focus.

I think much like the Army, we are focused on the individual marine and soldier in terms of equipment, and my sense is that we are gaining momentum in that particular area. Our vehicles are, you know, just very old, and we have got good programs in place that meets our mission needs. The issue that we have is the good

news is we are getting hot lines now. The challenges that we face have to do with the speed at which we are modernizing that fleet.

Mr. BACON. I will just close my comments as I am finished with my time here, we want to seek overmatch for our ground domain. And if we don't have it, we are going to have to work hard. So I would love to get your unfundeds [unfunded requirements] and see how we can fight harder to give you that overmatch, because parity isn't good enough for our soldiers and marines. Thank you.

Mr. TURNER. Mr. Carbajal.

Mr. CARBAJAL. Thank you, Mr. Chair. And thank you all for being here today. Lieutenant General Murray, in your written testimony, you stress the importance of prioritizing science and technology efforts and gaining understanding of state-of-the-art commercial and academic research in order to field the most modern capabilities to the force in the 2030s. I am aware that DOD and individual services have a number of research partnerships with academic institutions and commercial entities to share expertise and coordinate these efforts, research efforts.

Academic institutions, like UC [University of California] Santa Barbara and California Polytechnic State University San Luis Obispo, currently participate in Army and Air Force research partnerships through programs such as the University Affiliated Research Center and the Education Partnership Agreement program. These programs have helped build partnerships between academic institutions, services, and industry experts in an effort to engage in advanced research ultimately providing our personnel with the best technologies and capability.

Lieutenant Generals Murray and Ostrowski, what resources can this committee further provide to help the Army take advantage of the research and technology being done in the commercial and academic sectors? And lastly, would expanding these research partnership programs with academic institutions and commercial sectors assist in identifying cutting-edge research and technology?

General MURRAY. The answer to the first part of your question, Congressman, is I think this committee and Congress as a whole have made it very clear to us how important S&T funding is. And that is why we have not, even in declining budgets, reduced our S&T funding.

So right now, out of our modernization funds, the S&T budget is about 10 percent of that, which is a significant chunk of what I have for modernization. We recently just went through the process where we reshuffled some S&T funding away from near-term S&T back into basic research, which is really what you are talking about, in terms of getting after requirements that reach for technology for the 2030s and beyond. And we have partnerships throughout this country. I can think of—I was just down in Arizona State. We have a partnership at Arizona State. We have partnerships all through North Carolina. The ones in California are obviously very, very important to us, given the tech base out there.

But I can't—and General Ostrowski may come up with something—but we understand the importance of the S&T funding for our future.

General OSTROWSKI. General Murray, I would agree completely. And I want to thank all Members of Congress for the additional

$800 million that was placed in the 2017 budget with respect to the S&T portfolio.

The use of academia, as well as commercial marketplace, is absolutely essential in getting after leading-edge technologies that are filling the gaps that we are encountering on a daily basis. These are extremely important partnerships. There is no intent whatsoever to cut them off. And the ability to expand them is only a function of money.

Mr. CARBAJAL. Thank you very much. I yield back.

Mr. TURNER. I want to thank our witnesses and our members for the fact that we have had an incredibly efficient sprint of a hearing. We are going to actually make the votes. We have Wittman and Rosen next. And we have—Brown, I am sorry—and how much time is left? There is 11:43 on the clock, so we have plenty of time. Mr. Wittman.

Mr. WITTMAN. Thank you, Mr. Chairman. Gentlemen, thanks so much for joining us today. Thanks for your service.

Lieutenant General Thomas, I want to go to you. For years, between sequestration and BCA [Budget Control Act], we have had our ability limited to really provide the necessary resources I think in all levels for our men and women in the United States Marine Corps. And I think this year's FY 2018 budget still falls well short of where we need to be to make up for lost ground from years past.

And I want to go to a particular line in this year's budget that I would like to get your perspective on. The line in this year's budget says this: It says this budget reflects hard choices that the Marines made to protect readiness largely at the cost of modernization and infrastructure sustainment.

I believe that budgets need to be driven by strategy, not vice versa. And I am deeply concerned about there being a bill payer for readiness, especially when we look at infrastructure sustainment, modernization. That is like eating our seed corn. To me, that is deeply troubling.

Tell me this. If you were to be given additional resources this year, what would the priorities of the Marine Corps be to pipeline those resources to areas such as modernization and infrastructure sustainment?

General THOMAS. Thank you, Congressman. You know, our priorities are the Amphibious Combat Vehicle, Joint Light Tactical Vehicle, the G/ATOR radar, and then aircraft such as the CH–53K and MV–22, and there are others. We, again, as I alluded to, we have got programs in place. You know, additional funding would be used to accelerate those programs.

And to your point about sacrificing modernization for near-term readiness, that is something that has been a challenge for us over the past few years. We feel that this request improves on that somewhat. We have increased our ground modernization program by about 60 percent, up to $2.4 billion, significant investment for us. But now it is just a matter about getting out of the old metal as soon as we possibly can.

Mr. WITTMAN. Give your perspective, too. You talked a little bit about ACV. This year's budget does put some additional dollars into ACV for test vehicles and then 26 low-rate production vehicles

for ACV. Give me your perspective about how the Marine Corps came to 26 vehicles as the initial low-rate production number.

General THOMAS. This coming year, in 2018, is where down-select, you know, will occur. And so once that occurs, then we anticipate our request to increase. We are actually—the program is doing well. It is on a pretty tight timeline to make the IOC [initial operating capability] of 2020. So it is fully funded. We need to do down-select. And once we have done that, we can't really accelerate IOC any earlier, but we can accelerate FOC [full operating capability], which would be funds starting next year.

Mr. TURNER. Time is expired. Mr. Brown.

Mr. WITTMAN. Thank you, Mr. Chairman. I yield back.

Mr. BROWN. Thank you, Mr. Chairman. Both of my questions go to the Army. I will ask both of them. You can answer it and allocate the time accordingly. One, regarding the Mobile Protected Firepower vehicle program, and the question is, you have got the Bradley fighting vehicle. Why are we going to the Mobile Protected Firepower [MPF] program? Is it mobility, lethality, survivability?

Next question is on the CH–47. Army has a requirement for 14 more of those between the CH–47 and the MH–47 variant for SOCOM [Special Operations Command]. You are only asking for six. So that is—you know, a few less than your requirement. What is the impact on the mission? And do you anticipate an impact on your vendor in terms of their ability to keep pace with what you will eventually need? Thank you.

General MURRAY. Thank you, Congressman. So on the MPF, it is a completely different role than the Bradley plays. So it is—MPF is, in fact, a light tank. And we are targeting lethality between a 105- and a 120-millimeter cannon. And it is really not to go up against other tanks, but it is to maintain momentum of our light forces that we begin to field other vehicles to our infantry brigade combat teams. So it is not an infantry carrier. It is, in fact, a light tank that is, in fact, about the same weight as a Bradley, but it carries a much bigger punch and a little bit more frontal armor protection.

And then the CH–47, I will turn that over to General Ostrowski.

General OSTROWSKI. Yes, sir. The multiyear that we had with the Chinook ends in 2017. And we are, indeed, 14 short of our authorized amount within the Army. The intent going forward is to move to the Block II, CH–47F Block II, which provides greater capability over the current Block I.

However, when we do that particular venue, we know that we are going to be short in terms of the number of aircraft that we are able to buy each year. For instance, in 2018, you said yourself, sir, about six aircraft. Two of these are the 47F Block Is and two of these are the variant for SOCOM. That does not get better through 2020 to 2022; not until 2023 do we get back up to the point where we are producing the amount of aircraft from that facility that we have been in the past. So it is concerning.

Again, it is a combination of a transition to a new platform in terms of the capability. Again, same platform, greater capability. And a combination of doing that and the money that we have to invest in that particular upgrade to the current platform that is putting us in this position.

We are constantly working with the vendor, as well as partner nations in FMS [Foreign Military Sales] sales. This particular year, in 2017, the reason that we were able to execute the multiyear was because we had help from another country that brought us up to the level to get to the multiyear amount. So we will continue to push hard for that, because, again, we are running out of the ability to help that vendor just by our own buys alone.

Mr. BROWN. Thank you, Mr. Chairman. Thank you.

Mr. TURNER. Time is expired. Gentlemen, we are looking forward to the unfunded requirements lists that are coming out. And I would ask, as a continuing obligation for this hearing, if when they are available, if you would each provide to us your written perspectives on those, as we might be able to evaluate them as we go forward. So assume it as a question that has been asked to you here to get your thoughts and input concerning the unfunded list and the unfunded requirements list, and we will look forward to that if you could provide us that as soon as possible, as those might become available. Thank you.

[Whereupon, at 4:21 p.m., the subcommittee was adjourned.]

A P P E N D I X

MAY 24, 2017

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MAY 24, 2017

Statement of the Honorable Michael Turner
Chairman, Subcommittee on Tactical Air and Land Forces
Hearing: Ground Force Modernization Programs and the Fiscal Year 2018 Budget Request

May 24, 2017

The hearing will come to order.

The subcommittee meets today to review the Army and Marine Corps ground force equipment modernization budget request for fiscal year 2018.

From our previous hearings held in March we are aware that the Army and Marine Corps continue to face significant challenges in rebuilding full spectrum readiness from years of deferred modernization funding.

We are particularly interested in understanding how this budget request will begin the process of reversing the trend in deferred modernization funding.

I'd like to welcome our witnesses representing the Army and Marine Corps:

- Lieutenant General John M. Murray, Deputy Chief of Staff, G-8
- Lieutenant General Paul A. Ostrowski, Military Deputy to the Assistant Secretary of the Army (Acquisition, Logistics and Technology)
- Lieutenant General Gary L. Thomas, Deputy Commandant for Programs and Resources
- Brigadier General Joseph Shrader, Commanding General, Marine Corps Systems Command

Thank you each for your dedicated service to our Nation.

Today the subcommittee will review a broad portfolio of ground force equipment modernization programs and their associated acquisition strategies.

We expect to gain a better understanding of Army and Marine Corps modernization priorities in fiscal year 2018 and beyond.

As such, the witnesses have been asked to identify their top 5 modernization requirements and briefly summarize how the budget request addresses them.

The subcommittee will be particularly interested in learning of any unfunded requirements the Army and Marine Corps may have for fiscal year 2018.

Yesterday, the Administration released its budget request for the Department of Defense that amounts to a $603 billion topline.

Since we just received the request we are still in the early stages of reviewing the specifics of the budget request which makes this hearing so timely.

As I've stated at previous hearings, I support the President's commitment to rebuilding the military.

However, I am concerned that the current budget request does not go far enough.

I support Chairman Thornberry's statement that quote: "The Administration's budget proposal for defense is not enough to do what the President said he wants to do. In order to begin to repair the damage that has been done to readiness and to build the capability needed for today's dangerous world, we believe that $640 billion is required for fiscal year 2018" --end of quote.

A topline budget of $603 billion for defense in fiscal year 2018 really only represents 3 percent growth above President's Obama's projected budget request for fiscal year 2018 from last year.

To be fair though, it appears that the Army modernization request (procurement and RDT&E) and the Marine Corps ground equipment procurement request do provide for some improvement over fiscal year 2017 projected levels.

The problem is that due to multiple years of underfunding and reduced budgets, these relative modest increases aren't enough to actually reverse the damage that has already been done.

For example, the request provides the funding necessary to modernize about half of one armored brigade combat team, meaning the Army is on a path to fully modernize all of their armored brigade teams by 2035—which is a problem.

Finally, I continue to have concerns that we are losing our comparative advantage in ground combat overmatch against near peer and peer competitors.

Legacy combat vehicle platforms, in some cases are nearing the 40 year mark in terms of service, and I'm concerned that these vehicles are reaching limitations in terms of capability. So I am particularly interested in understanding how this budget request begins to address next generation combat vehicle systems.

I understand General Murray will provide opening remarks for the Army, followed by General Thomas who will provide the opening remarks for the Marine Corps.

General Murray please begin.

RECORD VERSION

STATEMENT BY

LIEUTENANT GENERAL JOHN M. MURRAY
DEPUTY CHIEF OF STAFF OF THE ARMY, G-8

AND

LIEUTENANT GENERAL PAUL A. OSTROWSKI
MILITARY DEPUTY, ASSISTANT SECRETARY OF THE ARMY (ACQUISITION, LOGISTICS AND TECHNOLOGY)

BEFORE THE

SUBCOMMITTEE ON TACTICAL AIR AND LAND FORCES
COMMITTEE ON ARMED SERVICES
UNITED STATES HOUSE OF REPRESENTATIVES

FIRST SESSION, 115TH CONGRESS

ON

FISCAL YEAR 2018 GROUND FORCE MODERNIZATION PROGRAMS

MAY 24, 2017

NOT FOR PUBLICATION UNTIL RELEASED BY THE
COMMITTEE ON ARMED SERVICES

INTRODUCTION

Chairman Turner, Ranking Member Tsongas, distinguished Members of the Subcommittee on Tactical Air and Land Forces, thank you for this opportunity to discuss the Fiscal Year 2018 (FY18) President's Budget request on Army Ground Force Modernization Programs. On behalf of our Acting Secretary, the Honorable Robert Speer, and our Chief of Staff, General Mark Milley, we look forward to discussing with you this year's budget request and the challenges the Army faces in its ability to modernize its forces.

Army modernization today stands at a precipice due to a combination of strategic, technological, and budgetary trends that threaten to place our Army at a disadvantage not only against advanced adversaries, but also against a broad range of other potential threats and enemies. In early 2016 the National Commission on the Future of the Army observed that reductions in Army modernization were elevating risk to the Joint Force. That military risk has already manifested itself: our Army is rapidly reaching a point where we will be outgunned, outranged, and outdated when compared to our most capable potential adversaries. Congress' full, timely support for the FY18 budget request and sustained, long-term, predictable funding are essential for the Army to progress toward a more modern and capable future force.

MODERNIZING THE FORCE

Challenges to Army modernization have been building over the course of nearly two decades. Adjusting for inflation, the Army has nearly half of the funding for modernization and equipment that it had just 8 years ago. Declining budgets drive difficult choices; we have faced these choices over many budget cycles.

The budget issue has been further complicated by 15 years of focus on counterinsurgency and counterterrorism as the Army addressed major effects in both current needs in Afghanistan and Iraq. This was the right thing to do, but it required

tradeoffs. The Army, fully aware of these tradeoffs, made the right choices to support our Soldiers for the missions and threats we faced at that time.

Meanwhile, our enemies have not been idle. The overmatch your Army has enjoyed for the last 70 years is disappearing rapidly. Our adversaries have observed the way we fight and have developed capabilities and tactics to counter our strengths and exploit our vulnerabilities. Some of these new capabilities and tactics have already been demonstrated in combat.

Fiscal constraints have forced the Army to accept risk in starting new developmental programs in order to prioritize incremental upgrades of existing systems that can be in the hands of Soldier quickly. Over the last 15 years, the Army has not modernized for full spectrum warfare thereby risking the loss of current and future overmatch in every domain: land, air, maritime, space, and cyberspace.

Our Soldiers must be able to prevail against the full range of potential threats, including near-peers in highly lethal combined arms maneuver; hybrid warfare; and determined, unconventional insurgents. This has become increasingly difficult, as our adversaries modernize at a rapid pace, while reduced and unpredictable funding has brought the Army's modernization effort to a pace that jeopardizes our overmatch.

RESOURCING MODERNIZATION

With respect to the budget, the Army has three main categories within the topline that it can adjust: Manpower, Readiness, and Capital Investment (of which Modernization is a part). Of these three, Readiness is our top priority. We are also committed to maintaining force structure. Any adjustments to these three categories are zero sum; there must always be a "bill payer" for every increase. Inflation and increasing personnel costs put increasing pressure on the Modernization portion of the budget.

Given this set of priorities, the Fiscal Year 2018 (FY18) President's Budget request allocated about 55 percent of the Army's topline to manpower. This is a must-pay bill. Readiness will consume approximately 25 percent of our budget; as the number one priority, the Army will not choose to reduce this allocation. This leaves roughly 20 percent for Capital Investment (Modernization and Military Construction).

Ideally, we would always have the most modern equipment, but this would require unacceptable tradeoffs with manpower and readiness. We would like to do all three, but large Modernization investments at the wrong time could lead to a force that is too small or a force that we cannot afford to keep ready. Maintaining balance across manpower, readiness, and modernization is key to preventing a hollow force. Without consistent and sufficient funding, we cannot effectively plan and execute a balanced Army program.

The Army has focused constrained resources on equipping for the near term at the expense of preparing for the future. The Army must be able to do both. The Army is sacrificing new program starts in order to prioritize incremental upgrades of existing systems that can be in the hands of Soldiers quickly. Given today's fiscal pressures, our equipment modernization strategy is structured to:

Protect Science and Technology to field capabilities to the force in the 2030s. We will prioritize Science and Technology efforts to develop new military capabilities to deter and defeat potential adversaries in the next fight. We are implementing a strategic approach to modernization that includes an awareness of existing and potential gaps; an understanding of emerging threats; knowledge of state-of-the-art commercial, academic, and Government research; and an understanding of competing needs for limited resources.

Sustain Incremental Upgrades. We have prioritized capabilities that have the greatest impact against a near-peer threat and can be in Soldiers' hands in the next 10 years. We are focused on improving the M1 Abrams Tank, M2 Bradley Fighting Vehicle, and Stryker Families of Vehicles, as well as Paladin, and the Guided Multiple Launch Rocket System. We are also improving the Apache, Black Hawk, and Chinook helicopter fleets, as well as our Unmanned Aircraft Systems.

Take Risk in New Development. The Army is making modest developmental investments based on our most critical operational requirements and capability shortfalls. Fiscal realities have led to the delay or discontinuance of new systems. Key investments that remain in the next generation of ground vehicle capabilities include the

Armored Multi-Purpose Vehicle and the Joint Light Tactical Vehicle, a critical program for the Army and the U.S. Marine Corps.

The Army will begin new developmental programs only if required to close an extremely high risk gap. We will attempt to accelerate Air and Missile Defense, Long Range Fires, Mobile Protected Fire Power, Active Protection Systems (Air and Ground), Assured Positioning, Navigation, and Timing, Electronic Warfare, and Cyber offensive and defensive capabilities.

Go Slow, Keep Options Open. We have, and will continue to, slow down procurement to keep production lines open and warm for when funding becomes available.

Reset and Sustain. The Army is returning equipment to the required level of combat capability; it remains central to both regenerating and maintaining equipment near-term readiness for ongoing operations and potential contingencies.

Divest. We are identifying equipment and systems that are excess, obsolete, or no longer required to reduce and eliminate the associated sustainment costs. For example, we are divesting the aging M113 armored personnel carriers from our BCT formations and legacy radios. Additionally, the Army's Mine Resistant Ambush Protected vehicles divestiture will eliminate a large portion of the fleet through Foreign Military Sales, distribution to other agencies, and demilitarization of older, battle-worn, excess vehicles. The Army also continues to divest its aging TH-67 training helicopters, as well as the OH-58A/C Kiowa, OH-58D Kiowa Warrior, and UH-60A Black Hawk fleets.

PRIORITIZING CAPABILITY GAPS

The Army's FY18 Budget Request represents our priorities for limited modernization resources, weighed against risks and critical capability gaps, in order to balance near-term readiness requirements against long-term force development objectives. The critical capability gaps, identified below, are the Army's Top Five modernization priorities that we must pursue in order to maintain and, eventually, regain overmatch to credibly deter and, if necessary, defeat near-peer adversaries.

Air and Missile Defense (AMD). We lack the capability and capacity to meet the AMD demands of the combatant commanders to cover key fixed sites and provide effective AMD protection of the maneuvering forces. The Army will:

- Provide an interim Maneuver-Short Range Air Defense (M-SHORAD) capability by FY21 and initiate an effort to improve lethality with a 50kW high energy laser.
- Complete service life extension and proximity fuse upgrade for all available Block I Stinger missiles to improve performance against unmanned aerial systems.
- Improve Patriot's performance against advanced threats and begin a significant upgrade effort for the Lower Tier AMD Sensor.
- Overhaul 72 Avengers to meet the European Restructure Initiative requirement for two Avenger Battalions.

Long-range Fires. The Army lacks capability and capacity to provide immediately responsive, effective surface-to-surface fires at ranges beyond 40 kilometers (km) for Cannon Artillery, beyond 84 km for Rocket Artillery, and 300 km for missiles; this gap is partially due to the aging Army Tactical Missile System (ATACMS) inventory. We will:

- Improve existing ATACMS missiles to extend service life until the new Long Range Precision Fires (LRPF) missile can be developed and fielded.
- Update the Guided Multiple Launch Rocket System (GMLRS) rockets by increasing the range and guidance systems to increase the lethality for specific targets at increased ranges.
- Develop a Cannon Delivered Area Effects munition, bridging strategy and long term acquisition strategy to ensure we are compliant within the cluster munition policy.
- Develop and integrate a seeker onto select missiles to target radiating emitters (e.g.; radars) on high value targets.

Munitions. The Army anticipates significant increases to ammunition requirements based on emerging peer and near-peer threats and increased demand in Iraq and Afghanistan. The Army has shortages of critical preferred munitions including Patriot, Hellfire, GMLRS, Precision Guidance Kits and Excalibur based on current and emerging requirements. We need to grow capacity in some of our Government-owned and

Contractor-operated ammunition plants and to broaden commercial capacity in order to meet the increased requirements for preferred munitions.

Mobility, Lethality and Protection of Brigade Combat Teams (BCTs). Our Armored, Infantry, and Stryker BCTs are deficient in the appropriate combination of mobility, lethality, and protection required to achieve overmatch during joint and combined arms operations. The Army will:

- Upgrade the lethality of our Stryker Brigades with the integration of the 30mm cannon. We will also increase the mobility, power, and network integration of our Double-V Hull Strykers.
- Pursue Mobile Protected Firepower to provide protected, long-range, direct fire capabilities to the Infantry BCT to ensure freedom of maneuver and action in close contact with the enemy.
- Replace legacy M113s in ABCTs with AMPV which will serve five mission roles: General Purpose, Mortar Carrier, Mission Command, Medical Evacuation, and Medical Treatment variants.
- Incrementally upgrading the M1 Abrams tank, M2 Bradley Fighting Vehicle and Paladin.
- Begin prototyping the next generation combat vehicle.

Active Protection Systems (APS) – Air and Ground. The proliferation of advanced man portable air defense systems significantly threaten Army Aviation in operational environments. On the ground, our combat vehicles lack the ability to effectively detect, track, divert, disrupt, neutralize, or destroy incoming missiles. The Army will:

- Develop and field the Common Infrared Counter Measure (CIRCM) and Advanced Threat Detection System (ATDS) to increase the 'detect and defeat' capability against the evolving MANPADS threat.
- Expedite the installation of commercially available APS systems on Armored and Stryker BCTs in Europe by the end of FY20.
- Initiate the Vehicle Protection System (VPS) program in FY18 to develop an integrated protection capability using the Modular Active Protection System (MAPS) as the common controller and software.

OPPORTUNITIES TO 'TURN THE TIDE'

Given the complex range of both near and long term threats, the Army has a very short window to improve both capability and capacity. By design, the Army drawdown was deliberately designed to reverse course and expand if necessary. Additionally, Army modernization, during the past several years of constrained funding and austerity maintained its resilience by:

- Protecting the defense industrial base by keeping production lines warm.
- Protecting modernization options by investing in the next generation of incremental improvements, emphasizing low risk and cost efficient improvements.

We have sustained many programs that can easily be accelerated if resources become available. The Army is prepared to accelerate delivery of enhanced air and missile defense, long range fires, armor formation upgrades, aviation fleet modernization, ammunition and missiles for emerging wartime requirements, lethality upgrades for Stryker vehicles, assured communications, Soldier lethality and protection and finally, electronic warfare. The Army is at an historical inflection point; we are postured to pivot rapidly if directed to do so.

IN CONCLUSION

We sincerely appreciate the opportunity to address the Fiscal Year 2018 President's Budget priorities and the challenges the Army faces in modernizing its force. These are challenging times. In the end, the security challenges of tomorrow will be met with the equipment we develop, modernize, and procure today. Because adversaries will continue to invest in technology to counter or evade U.S. strengths and exploit vulnerabilities, resource reductions and insufficient force modernization will place the Army's ability to overmatch its opponents at risk. It is critical that the Army receive sustained, long-term and predictable funding.

We can assure you that the Army's senior leaders are working hard to address current challenges and the needs of the Army both now and in the future. We are doing so with a commitment to be good stewards of our Nation's resources while meeting the equipping and modernization needs of our Soldiers.

Mr. Chairman and distinguished Members of this Subcommittee, we sincerely appreciate your steadfast and strong support of the outstanding men and women in uniform, our Army Civilians, and their Families.

Lieutenant General John M. Murray
Deputy Chief of Staff, G-8

Lieutenant General Murray was commissioned as an Infantry officer in the U.S. Army upon graduation from the Ohio State University in 1982. Throughout his career, Lieutenant General Murray has served in leadership positions and commanded from Company through Division, with various staff assignments at the highest levels of the Army.

Lieutenant General Murray has held numerous command positions. His command assignments include: Commanding General Joint Task Force-3; Deputy Commanding General – Support for U.S. Forces Afghanistan; Commander Bagram Airfield; Commanding General 3rd Infantry Division at Fort Stewart, Georgia; Commander, 3rd Brigade, 1st Cavalry Division, at Fort Hood, Texas while serving in Operation IRAQI FREEDOM; Commander, 1st Battalion, 18th Infantry, 1st Infantry Division, United States Army Europe and Seventh Army, Germany; Commander, C Company, 1-12th Infantry Battalion, 4th Infantry Division (Mechanized), Fort Carson, Colorado.

Previously, he was the Director, Force Management, the Pentagon; Assistant Deputy Director for Joint Training, J-7, Joint Staff, Suffolk, Virginia; Director, Joint Center for Operational Analysis, United States Joint Forces Command, Suffolk, Virginia; Deputy Commanding General (Maneuver), 1st Cavalry Division, Fort Hood, Texas; Deputy Commanding General (Maneuver), Multi-National Division-Baghdad OPERATION IRAQI FREEDOM, Iraq; G-3 (Operations), III Corps, Fort Hood, Texas; Chief of Staff, III Corps and Fort Hood, Fort Hood, Texas; C-3, Multi-National Corps-Iraq, OPERATION IRAQI FREEDOM, Iraq; G-3 (Operations), 1st Infantry Division, United States Army Europe and Seventh Army, Germany; Chief, Space Control Protection Section, J-33, United States Space Command, Peterson Air Force Base, Colorado; S-3(Operations), later Executive Officer, 1st Battalion, 5th Cavalry, 1st Cavalry Division, Fort Hood, Texas; Chief, Plans, G-1, III Corps and Fort Hood, Fort Hood, Texas.

Lieutenant General Murray's awards and decorations include: the Distinguished Service Medal w/Oak Leaf Cluster, the Defense Superior Service Medal with Oak Leaf Cluster, the Legion of Merit with two Oak Leaf Clusters, the Bronze Star Medal with three Oak Leaf Clusters, the Defense Meritorious Service Medal, the Meritorious Service Medal with two Oak Leaf Clusters, the Army Commendation Medal with Oak Leaf Cluster, the Joint Service Achievement Medal, the Army Achievement Medal with Oak Leaf Cluster, the Ranger Tab, the Combat Infantryman Badge, the Expert Infantryman Badge, the Parachutist Badge, the Air Assault Badge, the Joint Chiefs of Staff Identification Badge and the Army Staff Identification Badge.

Lieutenant General Murray hails from Kenton, Ohio. He and his wife, Jane, have three lovely daughters and seven grandchildren.

Lieutenant General Paul A. Ostrowski
Principal Military Deputy to the
Assistant Secretary of the Army (Acquisition, Logistics and Technology) and
Director of the Army Acquisition Corps

Lieutenant General Paul A. Ostrowski graduated from the United States Military Academy in 1985. He earned a Master of Science degree in National Resource Strategy from the National Defense University's Industrial College of the Armed Forces in 2006. He graduated from Joint and Combined Warfighting School at the Joint Forces Staff College in 2000. Additionally, he earned a Master of Science degree in Systems Acquisition Management at the Naval Postgraduate School in 1996.

Lieutenant General Ostrowski has more than twenty-five years of experience in acquisition, operational, and Joint assignments. He currently serves as the Principal Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA (ALT)) and Director of the Army Acquisition Corps. Prior to this assignment, Lieutenant General Ostrowski served as the Deputy Commanding General for Support, Combined Security Transition Command-Afghanistan. He also served as the Deputy for Acquisition and Systems Management, Office of the ASA (ALT) in Washington, D.C., from September 2014 to March 2016. Lieutenant General Ostrowski was assigned as the Program Executive Officer, Program Executive Office (PEO) Soldier at Fort Belvoir, Virginia, from April 2012 to September 2014. Previous assignments include the Assistant Deputy for Acquisition and Systems Management, Office of the ASA (ALT); Executive Officer to the Commander, United States Special Operations Command (USSOCOM), MacDill Air Force Base, Florida; Director, Operational Test and Evaluation, as well as PEO for Special Programs, USSOCOM; and Program Manager for Counterproliferation, USSOCOM. He served as a Legislative Fellow, as well as Project Leader for the Rapid Equipping Force in both Washington, D.C., and in Iraq during Operation Iraqi Freedom from June 2001 to July 2003. He also served as a Company Grade Officer in several command and staff positions in Joint Special Operations, Special Forces, and Infantry assignments.

Lieutenant General Ostrowski's awards and decorations include the Defense Superior Service Medal (with Oak Leaf Cluster), Legion of Merit, Bronze Star Medal, Defense Meritorious Service Medal (with Oak Leaf Cluster), Meritorious Service Medal (with Oak Leaf Cluster), Army Commendation Medal (with two Oak Leaf Clusters), Joint Service Achievement Medal (with Oak Leaf Cluster), Army Achievement Medal, Afghanistan Campaign Medal with Campaign Star, and NATO Medal. Additionally, he earned the Expert Infantryman Badge, Pathfinder Badge, Parachutist Badge, Air Assault Badge, Scuba Diver Badge, Ranger Tab, Special Forces Tab, and Army Staff Identification Badge.

STATEMENT OF

LIEUTENANT GENERAL GARY L. THOMAS
DEPUTY COMMANDANT, PROGRAMS AND RESOURCES
UNITED STATES MARINE CORPS

AND

BRIGADIER GENERAL JOSEPH SHRADER
COMMANDER, MARINE CORPS SYSTEMS COMMAND
UNITED STATES MARINE CORPS

BEFORE THE

TACTICAL AIR AND LAND FORCES SUBCOMMITTEE

OF THE

HOUSE ARMED SERVICES COMMITTEE

ON

FISCAL YEAR 2018 GROUND FORCE MODERNIZATION PROGRAMS

24 MAY 2017

Not public until released by the
House Armed Services Committee

Lieutenant General Gary L. Thomas, USMC
Deputy Commandant for Programs and Resources

Lieutenant General Gary L. Thomas is currently serving as the Deputy Commandant for Programs and Resources.

A native of Austin, Texas, he graduated from the University of Texas and was commissioned in 1984. He previously served as the Commanding General, 2d Marine Aircraft Wing.

Lieutenant General Thomas is a Naval Aviator and has served in several FA-18 squadrons. He commanded VMFA-323 during Operation IRAQI FREEDOM while embarked aboard USS CONSTELLATION (CV-64). He also commanded Marine Aviation Weapons and Tactics Squadron One (MAWTS-1), and he served as the Commanding General, 2d Marine Aircraft Wing (Forward) in Afghanistan from February to December 2013.

He has served as the Assistant Wing Commander for the 2d Marine Aircraft Wing, Assistant Deputy Commandant for Aviation, and the Marine Corps Deputy Director of Operations.

His Joint assignments include service in the Strategic Plans Directorate (J-5) and in the Force Structure, Resources, Assessment Directorate (J-8).

Lieutenant General Thomas is a graduate of the Weapons and Tactics Instructor Course, the Navy Fighter Weapons School, Air Command and Staff College, and the National War College. He holds a M.S. in National Security Strategy from National Defense University.

Brigadier General Joseph Shrader, USMC
Commander, Marine Corps Systems Command

Brigadier General Joseph Shrader, a native of Princeton, West Virginia, enlisted in the Marine Corps in January 1981. He served for three years with 3rd Battalion, 5th Marines as an infantryman and was promoted to corporal. After his enlistment, he returned to West Virginia where he earned an associate degree in Mechanical Engineering Technology and a Bachelor of Science degree in Electrical Engineering Technology from Bluefield State College. He was commissioned a second lieutenant through the Platoon Leaders Course commissioning program in 1989.

Upon graduation from The Basic School, Brigadier General Shrader attended the Artillery Officer Basic Course in Fort Sill, Oklahoma, and then reported to 5th Battalion, 10th Marines (5/10). While assigned to 5/10, Brigadier General Shrader served as a Guns Platoon Commander, Battery Executive Officer and Battery Commander, and deployed to Southwest Asia during operations Desert Shield, Desert Storm and Provide Comfort.

Brigadier General Shrader reported in June 1993 to Marine Corps Recruit Depot, Parris Island, South Carolina, where he served as a recruit training company Series Commander, Company Executive Officer and Company Commander. He then attended the Field Artillery Advanced Officer Course in Fort Sill, and in August 1996, reported to the III Marine Expeditionary Force (III MEF), Okinawa, Japan. While there, he was promoted to Major and served as Assistant Operations Officer, 4th Marine Regiment, and Battalion Operations Officer and Battalion Executive Officer with 3rd Battalion, 12th Marines.

He then attended the Marine Corps Command and Staff College on Marine Corps Base Quantico, Virginia, where he earned a Master of Military Studies degree. In June 2001, he was transferred to Marine Corps Systems Command where he served as the Armor and Fire Support Targeting Team Lead. Upon promotion to Lieutenant Colonel, he was reassigned to serve as the Deputy Program Manager for the Expeditionary Fire Support System.

In July 2004, Brigadier General Shrader returned to III MEF where he served as 12th Marines Operations Officer and later that same year deployed to Sumatra, Indonesia, in support of Operation Unified Assistance. In May 2005, Brigadier General Shrader received orders to stand up 5th ANGLICO, III MEF. In early 2007, he deployed in support of Operation Iraqi Freedom. In October 2007, he relinquished command of 5th ANGLICO and was reassigned as the III MEF Force Fires Coordinator.

In August 2009, he was promoted to Colonel after graduating from the Industrial College of the Armed Forces at National Defense University in Washington, D.C. He was then designated primary military occupational specialty (8061) Acquisition Professional Officer and assigned to Marine Corps Systems Command. Over the next four years he served as Product Group Director for Combat Equipment and Support Systems, and Product Group Director and Program Manager for Armor and Fire Support Systems.

In May 2013, he transferred to the Office of the Deputy Assistant Secretary of the Navy for Expeditionary Programs and Logistics Management to serve as Chief of Staff. In July 2014, Brigadier General Shrader took the helm as Commander of Marine Corps Systems Command.

Introduction

Chairman Turner, Ranking Member Tsongas, and distinguished members of the subcommittee, thank you for the opportunity to testify on Fiscal Year 2018 Ground Force Modernization Programs. Your Marines continue to be in high demand from all our combatant commanders around the world. They're forward deployed, engaged on land and sea, and ready for crisis response in Africa, Europe, the Middle East, and the Pacific. As a result, we must constantly balance between capability and capacity, between current operations and future operations, between steady state and surge readiness, as well as between low end and high end operations and training. Our role as America's 9-1-1 force informs how we man, train, and equip our force. It also drives how we prioritize and allocate the resources we are provided by Congress. While today's force is capable and our forward deployed forces are ready to fight, we have been fiscally stretched to maintain readiness across the breadth of the force in the near term, and to modernize for future readiness against the threats we will face in the future. The Marine Corps' Fiscal Year 2018 budget request begins to fix readiness for today and tomorrow, with increased support for warfighting readiness and modernization for tomorrow's fight.

Fiscal Year 2018 Budget Request – Aligning Strategic Priorities and Budgetary Goals

As the nation's naval expeditionary force-in-readiness, we must posture ourselves for the evolving operational environment characterized by complex terrain, technology proliferation, information warfare, the battle of electro-magnetic signatures, and a contested maritime domain. While we engage in the current fight and maintain our forward presence in order to respond to crises, our adversaries have developed new capabilities which now equal, or in some cases exceed, our own, such as creating combined arms dilemmas using information, cyber, deception, unmanned intelligence, surveillance, and reconnaissance (ISR), and long range precision fires in highly advanced and lethal ways. The evolution and expansion of the information domain, advanced robotics, and improved weapons technologies are causing threats to emerge with increased speed and lethality. The actions of ever more aggressive and capable peer competitors are demonstrating advanced multi-domain (ground, air, sea, space and cyber) capabilities across the range of military operations (ROMO). Anti-access and area denial capabilities are proliferating, becoming cheaper, more lethal, and harder to target. Cyber threats target the

digital networks that are essential to the way we currently fight. Information warfare exploits global communications and social media. And adversaries leverage advanced commercial off-the-shelf technologies that out-cycle our acquisition process.

In recognition of this new era, we developed the Marine Corps Operating Concept (MOC) which describes in broad terms how the Marine Corps will operate, fight, and win in the future operating environment. This concept is shaping our actions as we design and develop the capabilities and capacity of the future force. To this end, we conducted a bottom-up review of the force necessary to deter, and if necessary, defeat 21st century threats. This review, entitled Marine Corps Force 2025, identified critical gaps in capability and capacity that must be addressed in order to build a Marine Corps with the 5th Generation ground and aviation elements that can fight and win in this environment. Our Fiscal Year 2018 budget request of $26.3 billion for the base budget and an additional $12.3 billion for Marine Aviation begins the process of rebuilding a balanced Marine Corps for the 21st Century in a prudent and executable manner to resource existing modernization requirements, address existing readiness challenges and shortfalls in infrastructure, aviation and ground platforms, and address the new structure, materiel and training requirements for our 185K active force. With sufficient resources guided by strategy, the Marine Corps will be able to develop the capacity and vital warfighting capabilities that will allow us to pursue five critical tasks necessary to build a 5th Generation Marine Corps: evolve the Marine Air-Ground Task Force (MAGTF) to be able to fight across all warfighting domains, enhance our ability to maneuver, integrate the Naval Force to fight at and from the sea, operate with resilience in a contested network environment, and leverage the competence of the individual Marine.

Fixing Readiness For Today and Tomorrow

Modernization is central to addressing near-term readiness and foundational to building the Marine Corps of the 21st century. It includes the replacement of legacy systems with new ones, such as the Amphibious Combat Vehicle (ACV), Joint Light Tactical Vehicle (JLTV), MV-22 Osprey, CH-53K King Stallion, and Ground/Air Task Oriented Radar (G/ATOR), key components of our strategy to keep pace with expected future threats and our MOC. Modernization includes changes to the structure of our Tables of Equipment (T/E) as we continue to incorporate the lessons learned on the modern battlefield into equipment sets that

balance affordability with the need for a networked, mobile, and expeditionary force. And it includes the insertion of technological advances into current capabilities, including such efforts as developing active protection systems, long-range precision fires and counter-unmanned aircraft system (C-UAS) capabilities. Over the past decade and a half, funding constraints and operational demand increases have forced us to take risk in our future readiness in order to preserve current readiness, deferring critical future aviation and ground programs. Between Fiscal Year 2012 and Fiscal Year 2016, for example, Marine Corps spending on ground procurement decreased by 48 percent in its base budget. Continued sustainment of legacy systems cost more and more to repair and maintain, while not providing the capabilities we know are needed for the future operating environment. Investing in and accelerating our modernization programs directly correlate to improved readiness by achieving efficiencies and providing needed capabilities sooner. For Fiscal Year 2018, the Marine Corps has increased its ground procurement request to $2.4 billion, as well as aviation procurement request to $6.5 billion. The Marine Corps is committed to recapitalizing and modernizing these key capabilities and others to ensure success against increasingly capable current and future threats.

Ground Combat Tactical Vehicle Modernization

A primary focus of our ground modernization efforts continues to be our combat and tactical vehicle portfolio, which accounts for approximately 50 percent of the Marine Corps ground modernization investment. Our Ground Combat Tactical Vehicle (GCTV) modernization strategy is to sequentially modernize priority capabilities, reduce equipment inventories wherever possible and judiciously sustain remaining equipment. The overarching priority within the ground portfolio is the replacement of the legacy Amphibious Assault Vehicle (AAV), fielded over 40 years ago, with modern armored personnel carriers through a combination of complementary systems. The Amphibious Combat Vehicle (ACV) program is the Marine Corps' highest ground modernization priority and will use an evolutionary, incremental approach that consists of two increments, ACV 1.1 and ACV 1.2. Increment 1.1 will field a personnel carrier; Increment 1.2 will improve personnel carrier capabilities over Increment 1.1 and will deliver command and control (C2), recovery, and maintenance mission role variants. The AAV Survivability Upgrades Program (SUP), will complement the ACV Program within the Amphibious Assault Echelon. The AAV SUP improves AAV capability in four of the ten companies, to support Marine Expeditionary Unit (MEU) deployments. When

globally sourced, the four companies provide the essential capacity necessary for the assault echelons of two Marine Expeditionary Brigades (MEBs). ACV Phase 1.1 modernizes two of our ten amphibious vehicle companies. ACV Phase 1.2 will modernize the remaining four of ten companies. This combination of a modern amphibious armored personnel carrier alongside the improved AAV generates a complementary set of capabilities to meet general support lift capability and capacity requirements of our Ground Combat Element. In parallel with these modernization efforts, a science and technology portfolio is being developed by the Office of Naval Research (ONR) to explore a range of high water speed technology approaches to provide for an affordable, phased modernization of legacy capability to enable extended range littoral maneuver. These efforts will develop the knowledge necessary to reach an informed decision point in the mid-2020s on the feasibility, affordability, and options for developing a high water speed capability for maneuver from ship-to-shore.

The second highest priority within the portfolio remains the replacement of the portion of our High Mobility Multipurpose Wheeled Vehicles (HMMWV) fleet that is most at risk; those trucks that perform a combat function and are typically exposed to enemy fires. In partnership with the Army, the Marine Corps has sequenced the Joint Light Tactical Vehicle (JLTV) program to ensure affordability of the entire combat and tactical vehicle portfolio while replacing one third of the legacy HMMWV fleet with modern tactical trucks prior to the fielding of ACV 1.1. These core Marine Corps modernization efforts have been designed to ensure their affordability. With the continued support of this committee and Congress we will maintain the momentum to modernize this portfolio and ensure that our Marines are equipped to answer our nation's calls.

Amphibious Combat Vehicle 1.1

Leveraging demonstrated mature technologies, ACV Phase 1.1 awarded two Engineering and Manufacturing Development (EMD) contracts to BAE and SAIC. Both manufacturers have begun delivering vehicles and we are initiating an extensive test and evaluation phase that will lead to a down select in Fiscal Year 2018. The Approved Acquisition Objective (AAO) of 204 vehicles will provide lift for two infantry battalions and will achieve Initial Operational Capability (IOC) in Fiscal Year 2020. The aggressive acquisition schedule for ACV 1.1 requires full funding and support from Congress. The Fiscal Year 2018 President's Budget requests

$179.0 million in RDT&E for continued research and development, $167.1 million in procurement, and $1.3 million in operations and maintenance.

AAV Survivability Upgrade Program (AAV SUP)

AAV SUP is a well-defined program to increase the capability of the current vehicle by providing force protection upgrades to counter current and emerging threats to the underside of the vehicle. Specifically, the program will provide improved armor, spall liners, blast mitigating seats and protected fuel storage. These improved AAVs will play a key role in facilitating ship-to-shore mobility until replaced via a future phase of the ACV program. A contract was awarded to SAIC and all EMD vehicles are currently undergoing Operational Assessment that will inform a Milestone C decision later this year. The AAO for the program is 405 vehicles with IOC in Fiscal Year 2019. The Fiscal Year 2018 President's Budget requests $58.7 million in RDT&E for continued research and development, $107.7 million in procurement for Low Rate Initial Production (LRIP), and $2.7 million in operations and maintenance.

Joint Light Tactical Vehicle (JLTV)

The Marine Corps remains firmly partnered with the U.S. Army in fielding a JLTV that lives up to its name, while also being affordable. JLTV will deliver a modern reliable truck along with companion trailers, capable of performing multiple mission roles while providing protected, sustained, and networked mobility for personnel and payloads across the full spectrum of military operations. The JLTV has effectively controlled ownership costs by maximizing commonality, reliability, and fuel efficiency, while achieving additional savings through effective competition in all stages of program execution. Oshkosh Corporation was awarded a production contract for both Low Rate Initial Production (LRIP) and Full Rate Production (FRP) options, and those vehicles are currently in testing at various locations. The Fiscal Year 2018 President's Budget requests $20.7 million in RDT&E for continued research and development, $233.6 million in procurement, and $2.4 million in operations and maintenance. Funding for major activities in this budget includes continued developmental testing, validating the production process and continued LRIP assets. To date the Joint Program Office (JPO) has received nearly 250 trucks in support of the LRIP process. The approved AAO is 5,500 vehicles.

Rotorcraft Modernization

Marine Aviation is in the midst of a focused multiyear readiness recovery effort across every Type/Model/Series (T/M/S) in the current legacy inventory, all while we continue to procure new aircraft. Aviation readiness recovery is fragile; the plan requires stable and predictable funding, spare parts and supply support, flight operations, and time. Each T/M/S requires attention and action in specific areas: supply, in-service repairs, maintenance, and depot backlog. Our modern expeditionary force will require aircraft capable of flexible basing ashore or at sea in support of our Marine units. Our MV-22 Ospreys are key enablers in expanding the operational reach of Marines supporting Joint Force requirements The CH-53K Heavy Lift Replacement remains critical to maintaining the battlefield mobility our force requires, nearly tripling the lift capacity of the aircraft it is replacing. The Marine Corps UH-1Y Venom and AH-1Z Viper are also combat proven force multipliers for the Marine Air Ground Task Force. Other priorities outside our rotary wing aircraft include: persistent multi-role intelligence, surveillance, reconnaissance (ISR) such as RQ-21A Blackjack and the MAGTF Expeditionary UAS (MUX); supporting capabilities such as electronic attack and vertical lift; robust strike weapons programs; creating manned-unmanned teaming capabilities; targeted modernization of the force for relevance and sustainability; and the 5th Generation F-35B and F-35C Joint Strike Fighter (JSF) that will not only replace three aging platforms, but also provide transformational warfighting capabilities for the future. The acceleration of these key aviation modernization programs and others will directly enhance warfighting readiness and increase the lethality of the force.

MV-22 Osprey

The MV-22 is the assault support platform of choice for all Combatant Commanders (CCDRs). From MEUs to Special Purpose MAGTF – Crisis Response (SPMAGTF-CR), the speed, range, and aerial refueling capability allow the Osprey to remain postured in strategic locations throughout the world, ready and poised to quickly support Marines Corps operations wherever they are required. The Fiscal Year 2018 President's Budget requests $171.4 million in RDT&E for continued product improvements, and $228.3 million in APN to support Operations and Safety Improvement Programs (OSIPs), including Correction of Deficiencies, Readiness improvements, Common Configuration, and Aerial Refueling. To-date, 294 of 360 MV-22s have been delivered. The MV-22 continues to meet all Key Performance Parameters; cost and schedule also remain within established thresholds. Fiscal Year 2018 represents the first year of

the next V-22 Multi-Year Procurement (MYP) contract, MYP III, for production aircraft, sustaining Fleet aircraft, improving aircraft readiness, reducing operating costs, and expanding the domestic and international business base. The proposed MYP III contract will span seven years (Fiscal Years 2018-2024) and buy out the remaining domestic aircraft program of record. MYP III continues affordable procurement, provides stability to industry, and maintains a production line and contractual foundation to attract future V-22 international sales/customers. Continuing procurement under a MYP is especially beneficial to the supplier base as it provides long-term stability and generates lower costs that may incentivize international V-22 customers.

The MV-22 Osprey vertical flight capabilities, coupled with the speed, range, and endurance of fixed-wing transports, continue to enable effective execution of current missions that were previously unachievable. The MV-22 fleet continues executing at a high operational tempo consisting of multiple MEU deployments and two SPMAGTF-CR deployments in support of AFRICOM and CENTCOM. During 2016, the 15th of 18 planned active component squadrons achieved full operational capability (FOC), with the 16th scheduled for FOC in June 2017. These events are significant because community capacity is beginning to catch up to operational demand. However, due to CCDR's extremely high V-22 demand and operational tempo, the mission capability (MC) rates have not improved as desired. The primary contributor to lower than planned MC rates is our ability to train and keep enlisted maintainers with the requisite qualifications needed to sustain the high demand. An equally important secondary contributor is multiple V-22 configurations. In an attempt to increase our overall institutional readiness, the Marine Corps reduced each of the SPMAGTF-CR to a .5 VMM squadron footprint. The goal of this plan is to allow the remain behind element the time necessary to develop and train their personnel for future deployments and improve the overall V-22 readiness and MC rates.

Marine Aviation commissioned an Osprey Independent Readiness Review which identified a number of factors driving down MV-22 readiness. The major factor identified was the excessive number of aircraft configurations that resulted from years of concurrently incorporating engineering changes and reliability improvements during aircraft production. The "Common Configuration, Readiness and Modernization" (CC-RAM) plan will streamline the total number of V-22 configurations from 77 to 3, simplify the supply system, reduce the number of technical manuals and improve troubleshooting and maintenance procedures. This effort will decrease maintenance man-hours, increase aircraft availability and reduce total operating costs

by approximately $1.5 billion. The Fiscal Year 2018 OSIP provides a necessary and stable source of crucial modification funding as the program continues to implement these readiness and cost reduction initiatives.

Along with the readiness and support initiatives, the Marine Corps is adding new capabilities to the MV-22 that will make it even more valuable to the CCDRs such as the development of MV-22 Aerial Refueling System which will enable the MV-22 to deliver fuel to other airborne platforms. This capability is a critical enabler for both shore and sea-based operations and will extend the operational reach of deployed MAGTFs. Initial capability is planned to deliver by the summer of 2019. Another transformative capability for the entire aviation force is the continued development and integration of Digital Interoperability (DI). Initial DI fielded capability will consist of a suite of electronics to allow the embarked troop commander and aircrew to possess unprecedented situational awareness via real-time transmission of full motion video and other data generated by multiple air and ground platforms throughout the battlespace. This DI suite will also be able to collect, in real time, threat data gathered by existing aircraft survivability equipment and accompanying attack platforms, thereby shortening the kill-chain against ground and air based threats. A limited DI objective experiment was conducted utilizing a deployed MEU. The results showed promise and informed continued development of this capability.

CH-53K Heavy Lift Replacement Program

The Fiscal Year 2018 President's Budget requests $341.0 million in RDT&E to continue the Engineering and Manufacturing Development (EMD) phase of the CH-53K program and $756.0 million in Aircraft Procurement, Navy (APN) for Low Rate Initial Production (LRIP) Aircraft (Lot 2). The CH-53K achieved Milestone C, receiving an Acquisition Decision Memorandum April 3, 2017, authorizing LRIP. To date, four EMD Model aircraft have accumulated over 450 test flight hours, completed the first 'Operational Test Assessment' ahead of schedule and set a U.S. Heavy Lift record with an 89.5K Maximum Gross Weight lift. During Fiscal Year 2018, the program will continue to execute developmental test flights, complete the relocation of test assets to Naval Air Station (NAS) Patuxent River, and take delivery of System Demonstration Test Article (SDTA) aircraft (production representative aircraft utilized for Operational Test). Three of the four SDTAs will deliver to NAS Patuxent River to supplement the remainder of developmental test. Marine Test and Evaluation Squadron One (VMX-1) will

take delivery of the balance of aircraft at MCAS New River to execute publication and maintenance demonstrations prior to Operational Test & Evaluation.

The CH-53K will provide land and sea based heavy-lift capabilities not resident in any of today's platforms and contribute directly to the increased agility, lethality, and presence of joint task forces and MAGTFs. The CH-53K can transport 27,000 pounds of external cargo out to a range of 110 nautical miles under the most extreme operational conditions, nearly tripling the CH-53E's lift capability under similar environmental conditions, while fitting into the same shipboard footprint. The CH-53K will provide an unparalleled lift capability under high-altitude and hot weather conditions and greatly expand the CCDRs operational reach and flexibility. Compared to the CH-53E, maintenance and reliability enhancements of the CH-53K will improve aircraft availability and ensure cost effective operations. Additionally, survivability and force protection enhancements will significantly increase protection for both aircrew and passengers. Expeditionary heavy-lift capabilities will continue to be critical to successful land and sea-based operations in future anti-access, area-denial environments, enabling sea-basing and the joint operating concepts of force application and focused logistics.

As the CH-53E approaches 30 years of service, the community has accumulated over 95,000 combat flight hours in support of various combat operations. The unprecedented operational demand for these aircraft (peaking at 3x the published utilization rate) caused them to age prematurely. The material condition of our heavy lift assault support aircraft has degraded sooner than expected, which makes it more challenging to maintain and underscores the importance of its replacement, the CH-53K King Stallion. We have instituted a fleet wide "reset" of the CH-53E inventory to ensure we extract maximum utility and readiness until we transition to the CH-53K.

H-1 Upgrades Program

The H-1 Upgrades Program is replacing the Marine Corps' UH-1N and AH-1W helicopters with state-of-the-art UH-1Y Venom and AH-1Z Viper aircraft. Marine Corps Venom and Viper utility and attack aircraft have been critical to the success of the Marines in harm's way and have flown over 162,000 hours over the past decade. The Fiscal Year 2018 President's Budget requests $79.1 million in RDT&E for continued product improvements and $822.2 million in APN for 22 AH-1Z aircraft and system improvements. The H-1 program is a key modernization effort designed to resolve existing safety deficiencies and enhance operational

effectiveness of the H-1 fleet. The 85 percent commonality between the UH-1Y and AH-1Z will significantly reduce lifecycle costs and the logistical footprint, and increase the maintainability and deployability of both aircraft. The program will provide the Marine Corps with 349 H-1 aircraft through a combination of new production and a limited quantity of remanufactured aircraft.

The UH-1Y and AH-1Z aircraft are fielded with integrated glass cockpits, world-class sensors, and advanced helmet-mounted sight and display systems. The future growth plan includes a digitally-aided, Close Air Support (CAS) system designed to integrate these airframes, sensors, and weapons systems together with ground combat forces and other capable DoD aircraft. Integration of low-cost weapons such as the Advanced Precision Kill Weapon System II (APKWS II) provides increased lethality with reduced collateral damage.

The UH-1Y aircraft achieved IOC in August 2008 and FRP in September 2008. The "UH-1Y Forward" procurement strategy prioritized UH-1Y production in order to replace the under-powered UH-1N fleet as quickly as possible. The last UH-1N was retired from service as of December 2014. The AH-1Z program received approval for FRP in November 2010 and achieved IOC in February 2011. As of April 2017, 210 aircraft are operational within the Fleet Marine Force (146 UH-1Ys and 64 AH-1Zs). An additional 72 aircraft are on contract and in production, to include the first three of twelve Pakistan Foreign Military Sales aircraft. Lots 1-7 (Fiscal Years 2004-2010) aircraft deliveries are complete for both the UH-1Y and AH-1Z. Lots 8, 9, and 10 (Fiscal Years 2011-2013) deliveries are complete for the UH-1Y. Lot 11 UH-1Y deliveries are in progress and ahead of schedule. Additionally, the Czech Republic signed a Letter of Request for Letter of Acceptance in April 2017 for 12 UH-1Ys, which will be placed on contract in Fiscal Year-2018.

The H-1 Upgrades program is integrating both the UH-1Y and AH-1Z into the Digital Interoperability environment established throughout the MAGTF. With the integration of Intrepid Tiger II Electronic Warfare (IT II EW) pod, the Marine Corps' Light Attack Helicopter Squadron community will be able to provide MAGTF Commanders with all six functions of Marine Aviation, further increasing capability and flexibility. Additionally, these aircraft will incorporate Software Reprogrammable Payloads (SRP), which enables utilization of diverse networks and waveforms, thereby enabling maneuverability within the Electro-Magnetic (EM) spectrum. SRP will employ systems such as Link-16, Tactical Targeting Network Technology, Adaptive Networking Wideband Waveform, and the Soldier Radio Waveform.

Command and Control (C2) Modernization

Critical to the success ashore of the MAGTF is our ability to coordinate and synchronize our distributed C2 sensors and systems. A 5th Generation Marine Corps that will dominate the information domain requires transforming MAGTF C2 capabilities through a unified network environment that is ready, responsive and resilient, including integrating Navy and Marine Corps systems for naval amphibious forces to effectively command and control forces both afloat and ashore. The Combat Operations Center (COC) Family of Systems (FoS), for example, is designed to enhance C2 at all levels from the Marine Expeditionary Force (MEF) to Battalion echelons. We have delivered new MEF level COCs to I, II, and III MEF. Research and development is ongoing for cross-domain solutions to provide the ability to manually or automatically access or transfer information between two or more differing security domains. Enhanced C2 and digitally interoperable protected networks are modern capabilities that will facilitate improved battlefield awareness to and from small, dispersed tactical units. Our modernization priorities in this area are the Ground/Air Task Oriented Radar (G/ATOR), the Common Aviation Command and Control System (CAC2S) Increment I, and Networking On The Move (NOTM). These systems will provide modern, interoperable technologies to support real-time surveillance, detection and targeting and the common C2 suite to enable the effective employment of that and other sensors and C2 suites across the MAGTF. As warfare evolves into a battle of signatures and detection supporting an increasingly distributed MAGTF over greater geographical areas, these capabilities are vital to maximize the effectiveness of our forces.

Ground/Air Task Oriented Radar (G/ATOR)

G/ATOR is a highly expeditionary, medium range multi-role radar that represents the next generation in ground radar technology and will provide greater accuracy, detection, target classification, and performance against new and evolving threats and enemy countermeasures. G/ATOR will replace five legacy systems and will support air defense, air surveillance, counter-battery/target acquisition, and aviation radar tactical enhancements; the final evolution will also support the Marine Corps' air traffic control mission. G/ATOR Block 1 provides air defense and air surveillance capability, achieved Milestone C in 2014 and has received three of the six units which will be delivered this calendar year. G/ATOR Block 2 provides counter-battery/target acquisition and is in the EMD phase of acquisition. The Fiscal Year 2018 President's Budget requests $54.6 million in RDT&E for the continued development of G/ATOR Block 2, transition

to Gallium Nitride (GaN) module technology, $155.8 million in procurement funding supporting the LRIP of three G/ATOR Block 2 systems, and $10.6 million in O&M,MC for support of the fielded systems. The approved AAO is 45 systems.

Common Aviation Command and Control System (CAC2S)

CAC2S is a critical enabler within the Marine Air Command and Control System (MACCS) that will fuse weapons and sensor data into a single integrated display and serve as the sensor and data integrator between aviation and ground combat elements. Phase I Limited Deployment Capability was achieved 2nd Quarter Fiscal Year 2012 and the initial fielding was complete during 4th Quarter Fiscal Year 2013. Phase 2 addresses the remaining Air Combat Element (ACE) Battle Management and C2 requirements. Phase 2 achieved a successful Milestone C in Fiscal Year 2015, and fielding of that system has begun with the first delivery in May 2017. The Fiscal Year 2018 President's Budget requests $7.3 million in RDT&E for continued research and development, $44.9 million in procurement funding supporting 15 systems, and $19.8 million in O&M,MC for support of the fielded systems. The approved AAO is 50 systems.

Networking On The Move (NOTM)

NOTM provides the MAGTF with a robust, over the horizon/beyond line of sight digital command and control capability while on the move and at the halt. The Fiscal Year 2018 President's Budget requests $11.4 million in RDT&E for continued research and development, $111.3 million in procurement funding supporting 35 systems, and $22.9 million in O&M,MC for support of the fielded systems. The 35 systems consist of three variants: NOTM-Ground Combat Vehicle (GCV) – 20 systems, NOTM-Airborne (A) – 10 systems, and NOTM-Internally Transportable Vehicle (ITV) – 5 systems. The AAO for variants is: GCV – 140; A-Increment I – 8; A-Increment II – 39; and ITV – 32.

Tactical and Satellite Communications

To improve our tactical radios, we are in the process of developing the Acquisition Strategy for the next generation of High Frequency radios and will look to field a modernized, more capable, COMSEC compliant version in Fiscal Year 2020. Across the Satellite Communications portfolio, several related modernization efforts are scheduled starting in the

fourth quarter of Fiscal Year 2017 and concluding in Fiscal Year 2019. The Global Broadcast System will field multiple component systems to Marine Corps Forces Special Operations Command (MARSOC) in the fourth quarter of Fiscal Year 2017 and second quarter of Fiscal Year 2018. The Very Small Aperture Terminal program will release a modification instruction in July to update software for interoperability with Department of Defense (DoD) hubs. Lastly, Secure Mobile Anti-Jam Reliable Tactical Terminal (SMART-T) is scheduled to be procured in the fourth quarter of Fiscal Year 2017 and start fielding in the third quarter of Fiscal Year 2018 the capability to reduce the number of laptops required to operate the SMART-T. We continue to work with industry for solutions enabling operations in a contested environment. The Fiscal Year 2018 President's Budget requests $83.9 million in procurement for tactical and satellite communications.

Small Arms Strategy

Small arms weapons and ammunition help to power our Marines' ability to close with and destroy our opponents on the battlefield. We continuously evaluate and improve Marine Corps small arms capabilities, when technology and funding allow, to ensure that the individual Marine and units throughout the MAGTF are armed with the most reliable and relevant weapons systems available. In the near term, through Fiscal Year 2020, we are pursuing selective ground modernization and prioritized sustainment of legacy capabilities. This involves an incremental approach to improve small arms accuracy, lethality, ergonomics, and weight reduction. Current funding levels impact USMC small arms in the speed with which we can implement near term improvements. We will improve these capabilities on a graduated scale, starting with the infantry and expanding to other combat arms when feasible. Long term, beyond Fiscal Year 2020, we plan to make larger gains in capability through pursuit of next generation weapons with the other services, including our Army partners where collaborative effort is made possible when requirements and execution profiles coincide. Efforts now underway are driven by the end in mind – improved lethality while maintaining/improving the mobility of the individual Marine, the Marine Rifle Squad, and the MAGTF.

Conclusion

Congress and the American people have high expectations for the Marine Corps as our nation's naval expeditionary force in readiness. To achieve institutional readiness, sustain operational requirements, and be prepared for crisis and contingency response now and in the future, we must maintain the right balance of capability and capacity for our Marine Corps across our modernization, manpower and current readiness efforts. Our Fiscal Year 2018 budget request builds on the additional funding received in the Fiscal Year 2017 Omnibus appropriation and begins the deliberate effort to fix readiness both today and tomorrow, but the fiscal instability of the current fiscal year, Budget Control Act (BCA) caps, and the trend of repeated and protracted continuing resolutions continue to create inefficiencies, disrupt our planning, and directly challenge our current and future readiness. The Marine Corps manages uncertainty and risk through planning. Unstable fiscal environments prevent the deliberately planned, sustained effort needed to recover current readiness of our legacy equipment in the near term, and to modernize in the longer term. We must work to avoid a budget-driven strategy and return to a strategy-driven budget, informed by the strategic requirements of the current and future operating environments. The Marine Corps must begin to rebalance and modernize for the future, creating a 5th Generation multi-domain force with overmatch that can deter and if necessary, defeat a highly capable near-peer adversary. With your continued support, we can and will rebuild your Marine Corps for the 21st century.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MAY 24, 2017

QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. The Vice Chief of Staff of the Army in his testimony at the February 7th full committee hearing indicated Air and Missile Defense (AMD) as a top capability gap to address the urgent operational needs of combatant commanders and mitigate current threats. How does the FY18 budget request address this critical capability gap?

General MURRAY. The Army Fiscal Year 2018 (FY18) budget request addresses the Air and Missile Defense (AMD) capability gap by increasing procurement of critical systems and by beginning a Service Life Extension Program (SLEP) for Stinger missiles. For instance, we requested funding to begin procurement of AIM9X missiles (196), begin a Service Life Extension Program for Stinger missiles (1,440), and continue development of the Integrated Battlefield Control System, Indirect Fire Protect Capability, and an improved Lower Tier AMD Sensor. In support of developing a Maneuver-Short Range Air Defense or M–SHORAD capability, the FY18 budget request supports advancing a near term solution that considers the results of the recent tech demo event and initiatives in support of the M–SHORAD Family of Systems Analysis of Alternatives.

Mr. TURNER. What are your major concerns with munitions? What are you doing to address shortfalls?

General MURRAY. My major concerns with munitions include our inability to support multiple theater requirements while also meeting the training demand for munitions. For example, in Fiscal Year 2018 alone, the Army identified a $938 million shortfall in conventional munitions which range from small arms (e.g., 9mm and 5.56mm) to crew served weapons (e.g., .50 cal) to mortar and artillery munitions. I am also concerned that our aging munitions industrial base cannot support increased operational requirements in an efficient, cost effective manner while ensuring the protection and safety of employees and the environment. Finally, we lack sufficient capacity to produce the needed quantity of precision and near precision munitions. To address these shortfalls, the Army is making munitions a top priority and is moving resources from lower priority programs to increase funding for munitions. For instance, the FY18 budget request includes 6,000 Guided Multiple Launch Rocket System missiles, an increase of almost 1,800 missiles over FY17's request. The FY18 request also includes 998 Hellfire missiles, an increase of 840 missiles over FY17. However, fiscal constraints will not allow the Army to sustain the level of investment required to meet demand for munitions across the Future Years Defense Program. For example, we would need to invest over $600 million more per year to reach the maximum production rate for the Patriot Advanced Capability Missile Segment Enhancement missile, a key Combatant Commander required munition. The Army continues to look for opportunities to close these gaps through reprioritization of funds, increasing the efficiency of the munitions industrial base, and closely monitoring expenditures of critical munitions.

QUESTIONS SUBMITTED BY MS. TSONGAS

Ms. TSONGAS. What technological advances have been made, including in ensuring situational awareness and intelligence, surveillance, and reconnaissance (ISR) capabilities, to mitigate operational risk and enhance force protection for soldiers in small tactical units? How does the Army envision using resources included in the FY18 budget request and across the Future Years Defense Program (FYDP) to deploy these new technologies in the field?

General OSTROWSKI. The Army has recently made several technological advances to mature components and subsytems supporting small aerial and ground ISR platforms which have the capability to mitigate operational risk and enhance force protection for soldiers in small tactical units. This research included developing payload standards, increasing image resolutions, reducing audio signature, balancing power subsystems to increase distance and duration capabilities, and developing software algorithms which optimize performance. The Army will continue to advance these technologies by researching platform agnostic components and sub-system technologies which can be shared with multiple industry partners. The advanced capa-

bilities planned consist of research to enable: (1) operations in GPS-denied environments, (2) environmental sensing leading to collision avoidance, and (3) autonomy leading to collaborative behaviors (i.e. swarming) and (4) man-machine interfaces which will enable more autonomous operations, with limited operator intervention. Longer term basic and applied research is focusing on small unit sensor systems, sensor data analytics, communications, mission command and positioning, and navigation and timing in Global Positioning System (GPS) denied environments. These will be leveraged to further advance these systems, examples include: (1) GPS alternative technologies that provide state-of-the-art performance for soldier position and navigation; (2) Acoustic, radio frequency (RF), and electro-optic sensors and algorithms to detect and locate weapons fire and unmanned aerial systems in complex, noisy environments; (3) Stand-off sensors that provide non-line-of-sight situational awareness of power-grid activities in real time; Related enabling science and technology research which is being leveraged by these small aerial and ground ISR platforms programs include converged hardware and software architectures, cyber capabilities to the Corps and below, to include small unit/squad, technologies for distributed, networked sensing; jam-resistant soldier-borne antennas; adaptive protocols for resource-based data acquisition and signal processing on sensor networks; automated analytics for detection, tracking, and classification of adversaries; and techniques to mitigate network and sensor effects from jamming, spoofing, attrition, and non-cooperative emitters. The Army has designated tactical situational awareness and mission command for small units as a high priority research objective for FY18–24.

QUESTIONS SUBMITTED BY MR. BROWN

Mr. BROWN. The Army has embraced a non-developmental item (NDI) approach to the procurement of networked communications modernization—an approach that Congress has encouraged and fully supports. However, the Army has made changes to its requirements for certain programs, and has also chosen to reevaluate its needs, leading to delays in the fielding of important, modernized communications items to the warfighter. While Congress understands the importance of evaluating needs, the delays in the procurement and fielding of important communications items is concerning. First, the delay forces our soldiers to continue to rely on outdated and potentially vulnerable capabilities. Second, it discourages industry from investing more of their own funds in additional capability when there is an unclear path to an actual acquisition and return on said investment.

Given the ongoing studies the Army is conducting regarding its network, is it safe to say that changes to the current strategy will be made? When will the Army finalize and release any changes to this strategy? Additionally, are you comfortable with stating that changes in decisions to procurement strategies regarding tactical network modernization will not lead further delay putting tactical radios into soldiers' hands, or inhibit our tactical commutations readiness capability?

General MURRAY and General OSTROWSKI. Given the ongoing studies that the Army is conducting regarding the network, it is safe to say that the Army's current network strategy and procurement approach will adjust to appropriately address our operational needs and provide opportunities for greater use of industry innovation. What will not change is the Army's use of Non-Developmental network technologies and the full and open competitive process to support our procurement activities. Regarding adjustments in procurement strategies, as previously noted, the Army intends to continue leveraging the NDI approach with a full and open competitive process to support procurement of our tactical network systems. However, the methodology by which we assess/evaluate and determine the capabilities for our overall network requirements will shift from 'lowest price, technical acceptable' toward a "best value" methodology. Changing to a best value acquisition strategy will allow for greater opportunity to maximize industry potential without binding ourselves to a rigid set of parameters that limit flexibility and/or innovation that have proven to result in program delays in the past. While no one can truly state for certain that all delays will be averted, the adjustments to our network strategy and a shift to a "best value" approach aim to reduce future programmatic delays, ensure greater flexibility for the Army, improve the use of industry innovation and provide our warfighter with the best operational capability available.

Mr. BROWN. The Navy and Army both have major robotics procurements coming in the next 1–2 years; programs such as Man Transportable Robot Systems Increment II (MTRS Inc II), Common Robotics Systems (I), and Advanced Explosive Ordnance Disposal Robot System (AEODRS). What is the strategy for integrating these capabilities into the field and into the larger military context beyond how they are

being used now? Additionally, although the defense budget is going up overall, it's not necessarily being allocated in a way that ensures that service men and women are getting the newest, most capable technology in areas such as robotics. For example, it is my understanding the Marines are looking at purchasing robots initially developed in 2002 to meet their Explosive Ordnance Disposal capabilities because of challenges in the Advanced Explosive Ordnance Disposal Robot System Program. I would like to hear from all the panelists on this question, but particularly from BG Shrader.

General MURRAY and General OSTROWSKI. The Army's strategy for robotic systems is to integrate new technologies into our organizations to help ensure overmatch against increasingly capable enemies. Based upon the expanding roles for robotic systems beyond EOD, the Army chose to build upon the Navy's open source modular architecture and pursue lighter weight, lower cost, common chassis solutions using modular mission payloads to meet the needs of diverse organizations across the Army. This common chassis strategy provides greater efficiency for integrating these capabilities into the larger Army and reduced cost through economies of scale by buying thousands of similar systems rather than hundreds of multiple types of unique systems. The Army's Interoperability Profile (IOP) standards enable the development and selective upgrade of interchangeable modular mission payloads to perform specific warfighter functions across multiple platforms. This approach specifically enables the Army to focus more on its Robotic investments where they have the greatest impact: Updating interchangeable mission payloads with newer, increasingly capable technology. For example, a MTRS Inc 2 may be configured with a suite of EOD payloads or a suite of CBRN sensors. The Army IOP standards are fully compatible with the Navy's AEODRS standards. The Army anticipates the production of the MTRS Inc 2 in Fiscal Year 2019 and the Common Robotic System-Individual (CRS–I) in Fiscal Year 2021. Additionally, to ensure that Soldiers get the newest, most capable technology within current fiscal constraints, the Army is collaborating with our industry partners. The Defense Innovation Unit Experimental (DIUx) organization has facilitated the Army's outreach to non-traditional industry partners on the cutting edge of technology. This approach enables the rapid delivery of prototype capabilities to the Warfighter using a buy-try-decide methodology through newly expanded Other Transaction Authority (OTA).

Mr. BROWN. The Navy and Army both have major robotics procurements coming in the next 1–2 years; programs such as Man Transportable Robot Systems Increment II (MTRS Inc II), Common Robotics Systems (I), and Advanced Explosive Ordnance Disposal Robot System (AEODRS). What is the strategy for integrating these capabilities into the field and into the larger military context beyond how they are being used now? Additionally, although the defense budget is going up overall, it's not necessarily being allocated in a way that ensures that service men and women are getting the newest, most capable technology in areas such as robotics. For example, it is my understanding the Marines are looking at purchasing robots initially developed in 2002 to meet their Explosive Ordnance Disposal capabilities because of challenges in the Advanced Explosive Ordnance Disposal Robot System Program. I would like to hear from all the panelists on this question, but particularly from BG Shrader.

General THOMAS and General SHRADER. [The information referred to was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. BANKS

Mr. BANKS. LTG Murray, the Army G8 validated an operational needs statement (ONS) for a hydra rocket penetrating warhead for the field guided rocket system back in October, but still requires action on resourcing a material solution to the Apache helicopter war fighters. The USAF and USMC validated similar ONS and are in qualification programs to provide guided rockets with a penetrating warhead with incendiary effects that is already in the DOD inventory and in operational use by SOCOM. Is it not true that this capability is specifically noted in the Vice Chief of Staff of the Army's (VCSA) 2016 approved munitions strategy? Considering the high cost of guided missile systems such as Hellfire and considering that hydra rockets can now be precisely guided to a target, what is the Army's plan to provide this capability to the warfighter and take full advantage guided rocket technology that will provide more flexibility to the operational user to engage a broader spectrum of targets?

General MURRAY. Both the Chief of Staff of the Army (CSA) and the Vice Chief of Staff of the Army (VCSA) continue to place special emphasis on the development, procurement and positioning of critical munitions requested by the Combatant Com-

manders. In the case of the Operational Need Statement (ONS) for a penetrating warhead (M282) on an Advanced Precision Kill Weapon System (APKWS) equipped Hydra rocket, also known as a "guided" Hydra rocket, a request for the resources to develop, qualify and field the weapon system was recently submitted as priority numbers eleven and twelve on the CSA's Fiscal Year 2018 (FY18) Unfunded Requirements list (reference numbers 0978 and 0976). The resource requirements identified in the UFR take advantage of other services' integration and qualification efforts where applicable. In the meantime, the Army is procuring and fielding the APKWS guidance sections with a widely used High Explosive (HE) warhead (M151) in support of our Soldiers in current areas of operations. The Army plans to continue procurement of 2,000 APKWS per year beginning in FY18 leveraging an existing Navy contract. A FY18 UFR (reference number 0978) has also been submitted to double the number of APKWS the Army procures (from 2,081 to 4,000) that will take advantage of investments in the production line that will increase capacity for all services. For the Army, APKWS is qualified on the AH–64D/E Apache and is currently constrained to operations in the U.S. Army Central Command Area of Responsibility by an Urgent Materiel Release. Full Materiel Release, allowing unconstrained use of the weapon system, is expected in FY19.

QUESTIONS SUBMITTED BY MR. BISHOP

Mr. BISHOP. The Marine Corps has been evaluating Australian technology through the Foreign Comparative Testing Program for Rifle Accessory Control Units (RACUs) that would allow troops to manage their electronic and battle management systems while keeping hands-on situational awareness at all times. This technology, already used abroad, if implemented within the U.S. military, would allow troops to keep their hands on their weapon with heads-up and eyes on the target all while being able to manage incoming and outgoing communications with other systems. It is my understanding that the Marine Corps has exercised its option under the existing testing and evaluation contract to go to Phase 3 of testing, which includes additional communications management capabilities. It is also my understanding that the Marine Corps supports obtaining a significant number of RACU units so that additional demonstration can take place at the Battalion level and to investigate further this technology's use with systems such as drones, re-supply robots, heads-up displays on night vision goggles, and the like.

(1) Does the Marine Corps support additional advanced systems testing and the production of the RACU units during Fiscal Year 2018 and beyond to support such testing; and (2) What is the Marine Corps assessment to date of the benefits of this technology as a part of troop modernization efforts?"

General SHRADER. [The information referred to was not available at the time of printing.]

QUESTIONS SUBMITTED BY MR. WITTMAN

Mr. WITTMAN. I am not sure how you are soliciting for a new system without a new authorization. I was told that the initial plan was to purchase this new system using Operation and Maintenance funds, now I understand that new systems should be purchased with Procurement funds. Please clarify your authority for the RFP and whether a new start is required.

General SHRADER. [The information referred to was not available at the time of printing.]

Mr. WITTMAN. The Marine Corps states that it wants a high glide canopy, which covers significantly more horizontal distance when jumped from the same altitude as the currently fielded system. Is a high glide canopy truly a requirement? If so, where in the Corps did this requirement originate and how was it approved? Also, does the Marine Corps have all of the other equipment (oxygen bottles, tandem parachutes, and guided cargo parachutes) required in order to employ the high glide canopy?

General SHRADER. [The information referred to was not available at the time of printing.]

Mr. WITTMAN. The Marine Corps has a large number of PARIS, Special Application Parachute ("SAP") canopies that are high glide in inventory but that are seldom used. Why is the Corps fielding a new parachute when it already has parachutes with high glide canopies?

General SHRADER. [The information referred to was not available at the time of printing.]

Mr. WITTMAN. When the Army purchases parachutes, it relies on the engineers at U.S. Army Natick Soldier Systems Center to develop a specification addressing the military's unique requirements. Instead of using a military specification, it appears that the Marine Corps is using the Parachute Industry Association ("PIA") specification, which is for sports parachutists jumping from relatively slow moving planes and without the equipment that military parachutists carry. What assurances does the Marine Corps have that the PIA specification will get the Marine Corps the gear they need?

General SHRADER. [The information referred to was not available at the time of printing.]

Mr. WITTMAN. I understand that the Marine Corps plans on conducting a "paper" down select and only test the parachute once first articles are received. I believe that testing is critically important. I would like your thoughts on why testing is given short shrift in this procurement.

General SHRADER. [The information referred to was not available at the time of printing.]

Mr. WITTMAN. The sports parachute industry has been unable to develop reliable high glide canopies. The Army has struggled with the RA–1 parachute and grounded the parachute for several months last year. The reliability challenge, I am told, is one of aerodynamics. High glide canopies have to be large and relatively flat. This geometry requires longer lines and increases the opportunity for malfunctions especially lines on top of the canopy. Why is the Marine Corps considering going from a very reliable system to one that because of the geometry is almost certainly less reliable? Do you have safety concerns?

General SHRADER. [The information referred to was not available at the time of printing.]